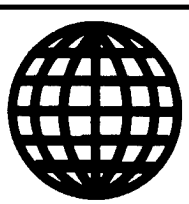
JPRS-EST-92-039
29 December 1992



FOREIGN BROADCAST INFORMATION SERVICE

JPRS Report

Science & Technology

Europe

Economic Competitiveness

Science & Technology
Europe
Economic Competitiveness

JPRS-EST-92-039 29 December 1992

CONTENTS

CORPORATE STRATEGIES

EUROPE-ASIA RELATIONS

SCIENCE & TECHNOLOGY POLICY

Netherlands To Cut R&D Budgets

General Trends

93BR0007A Rijswijk POLYTECHNISCH WEEKBLAD in Dutch 17 Sep 92 p 3

[Article by Gerard van Nifterik: "The Netherlands Continues To Weaken Its International Position"]

[Text] The Netherlands is well on the way to forfeiting its favorable position in the field of technology. The budget which was released on Tuesday has not halted the trend toward stagnating expenditure for research and development. This situation has been made even worse by the increase in R&D expenditures abroad while our financial efforts at home keep dropping.

Initially (until circa 1990), our country had a prominent position in the field of science and technology. In 1989, R&D expenditures had risen to nearly 10 billion guilders, which was equivalent to approximately 2.2 percent of our gross national product. Although this was considered a reasonable percentage, a substantial amount of criticism was still voiced. The 2.2 percent was considerably less than Japan (circa 3 percent), Germany and the United States (each 2.8 percent), and France (2.4 percent). For example, Elsevier quoted a few months ago that, when compared with all the OECD [Organization for Economic Cooperation and Development] countries, the Netherlands spent the least on R&D. However, according to statistics of the OECD itself, the situation is not all that bad. In 1989, the Netherlands was in ninth position, trailing the previously mentioned superpowers, but well ahead of Austria, Belgium, and G-7 members such as Italy and Canada.

If only the nonmilitary part of R&D spending is taken into account, the Netherlands attains third position within the OECD, following Japan and "high-flyer" Sweden.

The 1991 World Competitiveness Report listed the the industrialized countries according to their degree of competitive power.

Although the Netherlands did not reach the top-three positions in any of the nine different ranking lists, it still rated reasonably well (better than Italy in eight lists, and better than France in seven lists). In the ranking list for "science and technology," the Netherlands attained seventh position, ahead of the previously mentioned Latin countries and also ahead of the United Kingdom.

During the eighties, the Netherlands had a prominent position and the government invested more and more money in industrial research. Between 1988 and 1989, the government contribution to R&D funding rose from 8.8 percent to 10.6 percent. During the same period, government R&D funding in other countries decreased, especially in the United States, France, and Germany. In Great Britain, the government's contribution plunged from 30 to around 16 percent.

[Box 1]

Competitive Power (Science and Technology)

1. Japan 2. United States 3. Switzerland 4. Germany 5. Finland 6. Sweden 7. The Netherlands 8. France 9. Great Britain 10. Belgium 11. Italy 12. Ireland 13. Norway 14. Austria 15. Spain

Industry

Up to 1990, the Dutch government's contribution was very reasonable, but what did the business community do? From 1983, corporate R&D rose by approximately 1.5 billion guilders to reach nearly 6 billion guilders in 1988, but stagnated thereafter (source: "Technology and Scientific Indicators," TWIN 1991). Even more significant was the decrease, especially during 1988 and 1989, in corporate R&D spending levels, whereas industry has always been criticizing the government for spending too little on R&D. In a survey conducted this summer by FINANCIEEL ECONOMISCH MAGAZINE, it was subtly concluded that AKZO, for example, reduced its research staff by almost 300 jobs. Shell also reduced its R&D workforce.

Such statistics must be regarded in their correct context. The 1991 TWIN report concluded that, for instance from 1987-88 onwards, the stagnation in industrial research was mainly due to the research savings made by Philips (in guilders). As Philips accounted for approximately one-third of national industrial R&D, this had a significant effect on the overall situation.

The "top-heavy" position of Philips's R&D within the Netherlands roughly indicates where the problem lies. An increasing amount of concern is being voiced about the vulnerable state of technology in our country due to excessive fragmentation and the consequent lack of size. In this context, developments in the field of spearhead technologies constitute a cause for special anxiety, simply because they require a high level of knowledge and are expensive. Our country, with its many small and medium-sized enterprises, simply lacks the scope required to compete with the "big boys," especially in "high-tech" areas. In this respect, we are not concerned with matching the R&D expenditure of the other countries, but only in hearing the clinking of guilders.

If our small country of the Netherlands is to continue to compete in these high-technology areas—we have no choice given our high wage levels—more money must be forthcoming. If this money is not provided, the Netherlands, just like other small European nations, will become bogged down in a kind of "muddle-on policy" (where there is no real long-term strategy or vision) and where it will be difficult for us to play any significant role on the world scene.

[Box 2]

Nonmilitary R&D as a Percentage of the GNP

1. Japan: 2.8 percent 2. Sweden: 2.8 percent 3. The Netherlands: 2.1 percent 4. United States: 2.0 percent 5. France: 1.8 percent 6. Europe: 1.8 percent 7. Belgium: 1.7 percent

Devilish Coincidence

In this climate, there has understandably been some concern within the business community as, during the past few years, the government seems to be aiming toward reductions instead of toward increases.

The Ministry of Economic Affairs' industrial high-technology subsidies have been affected most since last year's intermediate budget survey. Estimates for "technology-relevant" expenses by the different ministries are indicative of the trend: From more than 3 billion guilders in 1990, they drop to 2.5 billion next year.

The course the Netherlands is currently following therefore seems to be a devilish coincidence of two negative trends: First, overall government R&D spending will drastically drop, especially with regard to technology; second, corporate R&D is more likely to shrink than to expand, mainly due to the problems at Philips.

The resulting overall picture is that Dutch R&D spending will successively decrease during the nineties, while our neighboring countries tend to increase their R&D funding. For example, the French 1992 budget for technology policy increased by 5 percent; the German one, by 10 percent. The Swiss 1992 technology budget even increased by 48 percent compared with 1991.

It need not be said that this trend will weaken the Netherlands' technological position internationally.

Ministry of Education

93BR0007B Rijswijk POLYTECHNISCH WEEKBLAD in Dutch 17 Sep 92 p 3

[Text] The national budget for 1993 of the Ministry of Science and Education states that during the coming years, savings of a few million guilders will be made in the field of scientific research, reaching 19.9 million guilders from 1998.

These savings will primarily affect research projects. The main target for these savings will be the budget for coordinating and restructuring the contents of research, which will be reduced by 7 million guilders in 1993 and by 15.4 million guilders in 1996. In 1997, it will lose a little bit less, 14.4 million, and as of 1998, it will structurally be reduced by 7 million guilders. These savings must be achieved by merging or canceling some subsidy schemes. One example of this is the cancellation of the "knowledge transfer program" at the end of this year.

The government will base its policy for the coming years on surveys and analyses of social and scientific developments. The results of these analyses will provide the starting point for boosting or cutting back on specific areas of research. The overdue Science Budget for 1993 will be published in December, together with preliminary advice about research priorities in the so-called "Strategic Policy Document." The Ministry of Education and Science will ensure that a maximum of 3 percent of the yearly budget is allocated for essential research on the grounds of social developments. This will give universities an opportunity to respond to the results of these surveys.

The scientific infrastructure will not be affected. Investments in equipment and special provisions for research will therefore remain the same.

Ministry of Economic Affairs

93BR0007C Rijswijk POLYTECHNISCH WEEKBLAD in Dutch 17 Sep 92 p 3

[Article by Bart Stam and Frans Janse: "Queen's Speech: More Government and Private Projects: Ministry of Economic Affairs Revises Technology Stimulation Projects"]

[Text] Despite Minister Andriessen's numerous wishes, his Ministry will have to reduce the expenditure for technology support in 1993. The budget will fall by 154.8 million to 891 million guilders. This drop can mainly be attributed to the scrapping of the Innovation Stimulation Program (INSTIR).

In contrast to the state budget for previous years, no programs will have to be dropped in the new state budget. In September of last year, the INSTIR program was the victim of cabinet economies. Due to the scrapping of INSTIR (which cost 126.3 million guilders this year), the budget for industrial and general technology policy will fall below 1 billion guilders. No new program has been proposed to replace INSTIR. Minister Andriessen wishes to strengthen the position of the clusters of technology-oriented small and medium-sized enterprises [SEMs] by coordinating their technological efforts. Andriessen, however, noted that the Ministry of Economic Affairs has yet to define a concrete policy.

Technology Projects

The minister recognizes that technology suppport provided by the business community and the government lags behind other western countries, but he does not consider that this has already had a negative effect on the competitive position of the Dutch business community. If the competitive position does, however, deteriorate, he admits that an intervention will be necessary. Moreover, Andriessen expects the various European technology projects to have a favorable impact on the Netherlands.

An explanatory memorandum from the Ministry of Economic Affairs stated that it wishes to shift the

responsibility for technology support of large projects to R&D networks of industries and research establishments. The Ministry of Economic Affairs also wishes to increase the interest in science and technology in society. Examples of this are the subsidies to the National Center for Science and Technology in Amsterdam, the Science and Technology Week, and the National Technology Award. Next year the ministry will submit the Goverment Technology Policy document to the Dutch Second Chamber. The Ministry of Economic Affairs has become the coordinating department for technological policy. It provides 85 percent of the total government expenditure for technology.

The Ministry of Economic Affairs will shift its support toward joint government-industry technology projects. This was inspired by the fact that, in larger projects, several companies cooperate closely with major technology institutes and with the TNO [Dutch Central Organization for Applied Research]. One example of this is the VOLEM project undertaken by the TNO's Engine Institute and DAF, which is devoted to reducing the fuel consumption and harmful emissions from diesel engines. Another project which serves as a model for the required research cooperation between industry and research institutes involves the development of a new environment-friendly copying machine. OCE-Van der Grinten and TNO are working on this product.

Largest Program

Expenditures within the scope of the Company-Oriented Technology Stimulation Program (PBTS) have fallen from 354 million guilders to 323.9 million guilders. PTBS is the largest technology stimulation program and covers four main areas: environmental technology, new materials, information technology, and biotechnology. The Ministry of Economic Affairs is currently evaluating whether parts of the separate program areas require new emphasis.

Next year, the Ministry of Economic Affairs intends to spend more money on energy saving and long-lasting energy. The budgets will be increased from 204.6 million to 283.7 million guilders. A significant part of this can be attributed to the 179-million-guilder subsidy increase for total energy power generation projects already made by Minister Andriessen. Research and development in the field of energy saving must however be reduced: from 111.1 million to 104.5 million guilders.

EC Technology Training Program Reported Successful

93BR0028 Paris ENTREPRISES & TELECOMMUNICATIONS in French Oct-Nov 92 p 10

[Text] The year 1992 has been a key year for the EC's COMETT [Community Program for Education and Teaching in the Field of Technology] program. The contacts between universities and industry are working very well. This year, 49 university-industry training associations (AUEF) have been created, which brings the total number to 207. These AUEF's cover all areas of Europe and all the main technological sectors, from new materials and telecommunications to information technology. There were 863 project proposals, of which 555 have been accepted. A total budget of ECU55 million will be committed over a three-year period. Overall, the COMETT program involves nearly 5,200 European companies, approximately 1,700 universities and centers of higher education, and 2,000 professional organizations.

French National Committee for Research Evaluation Presents Results

93WS0030A Paris LE MONDE in French 7 Oct 92 p 13

[Article by Catherine Vincent: "Research Under the Microscope"]

[Text] *After three years of appraisement, the National Committee for Research Evaluation (CNER) presents the initial results of its work.*

Around the beginning of October, the CNER [National Committee for Research Evaluation] presented five reports to the supervising authorities, focusing respectively on the French Space Program, the French Research Institute for Exploitation of the Sea (IFREMER), the National Institute for Sciences of the Universe (INSU), the Scientific and Technical Center of the Building Industry (CSTB), and Public Interest Groups (GIPs).

If only because of its size, with 16.7 percent of the Civil Research and Development Budget (BCRD) in 1992—that is to say, the biggest slice of the large-scale technological development programs budget—and its growth rate (7.2 percent in 1993), the French space program warranted a study, by the CNER, of its procedures, its management, and its various components, with the object of "assessing its coherence, from the standpoint of its objectives and the means available for their attainment."

Noting that "spending in the space sector during the last few years has grown at a faster rate than that of the French research sector as a whole," the Committee deems that the share of the public outlay for research that is devoted to space "cannot continue to increase without introducing serious difficulties for other research sectors that also qualify for funding." The Committee suggests in particular that "activities that have become operational, such as the Meteosat satellites, which should be financed by other sources," be excluded from the program being funded by the BCRD. And it underlines the urgent need for the government to "become actively involved in satisfying the requirements for launching scientific, defense, and earth observation satellites, for which the Ariane-5 program is not directly suited."

With a total annual budget of over 860 million French francs [Fr], of which Fr750 million come from the BCRD, IFREMER was formed in 1985 by merging the National Center for Exploitation of the Oceans (CNEXO) and the Scientific and Technical Institute of Maritime Fishing (ISTPM). An amalgamation that explains without, however, justifying the fact that its field of action today remains "a juxtaposition of very different, indeed disparate, activities," and "a large geographical and thematic overdiversification."

Pointing out that IFREMER's "missions are insufficiently defined"—functioning at one and the same time, as it does, as a technical service for the Ministries of the Sea and of Environment, a research structure, and operator of the deep sea oceanography fleet—the CNER also mentions "the seriousness of the aging process" affecting this organization. It recommends that the government "spell out a French oceanography policy," and that it clarify the financing of this EPIC [Industrially- or Commercially-Oriented Public-Sector Enterprise], with a view to placating "the conflicts that arise between its concern for increasing the organization's own resources (...) and the consultation and evaluation services and missions it performs for the government authorities concerned with technological transfers and research strictly speaking."

In 1985, taking the place of the National Astronomy and Geophysics Institute (INAG), the INSU, which operates under the National Center for Scientific Research (CNRS), enlarged its sphere of activities to include geology and oceanography. Its annual budget of over Fr230 million is divided among three divisions: Astronomy and Astrophysics (52.7 percent), Oceans and Atmosphere (21.8 percent), and Earth Sciences (25.5 percent). Of this sectorial organization, the CNER report takes a dim view: "By and large," it states, "INSU appears to be none other than a juxtaposition of its three scientific divisions. It has neither drawn up nor evidenced a real strategy that might in some way pertain to its mission."

Pointing out the "very positive" role played by this organization in the heavy equipment sector (in astronomy as well as oceanography), the CNER again decries "the absence of a veritable national coordination of French oceanic programs, which is not being provided either by IFREMER or by INSU." It expresses doubts, moreover, on "the confusion that reins between the modes of subsidization taken over by INSU and those for which the CNRS's Sciences of the Universe Department is responsible," and suggests the creation of an agency or committee on a national scale, and external to the CNRS, to "coordinate and combine the efforts of the bodies active in the sphere of sciences of the universe."

The CSTB, responsible for "carrying out studies and scientific research of interest to the building and housing industries," operates on an annual budget of over Fr260 million, Fr100 million of which are provided under the BCRD. It was created in 1947 in the form of a foundation, and was transformed in 1957 into an EPIC. The CNER's evaluation, carried out at the joint request of the ministers of research and housing, centered mainly on determining the CSTB's strengths and weaknesses in the new environment created by the implementation of the European directive on building products.

Referring first to "the pioneering role played by the Center and its managers in sensitizing their colleagues in the construction industry to the opportunities of the unified European market" and to the soundness of the Center's normative and para-normative functions, the Committee points out that research also represents "a considerable part" of CSTB activity: Its research is "of good quality on the whole," but could be further improved. In particular, the CNER recommends that CSTB "resort more systematically to the scientific resources of university laboratories, and to those of basic and applied research organizations," and that it consider "setting up data gathering stations for the research workers of the institutions of higher learning and research."

The object of the GIPs, formed in 1982, is to group public or private organizations for a specified period of time around a common project. Approximately 30 GIPs are currently operating, bringing together some 260 partners, in a "cooperative structure that is attracting a variety of team-ups," which, the CNER believes, constitute a "definite, although limited and conditional," innovative added value.

"Mixed" GIPs (associating public and private enterprises as partners), by far the most numerous and most dynamic, succeed in taking advantage of the "hybrid nature" of a structure that is subject to both public-sector oversight and private-sector economic performance, but the formula "has not yet been tested in the domain of research strictly speaking." The CNER evokes the "learning difficulties of the codified mixed venture," and the insufficiencies resulting therefrom (absence of follow-up of programs, nonstandard presentation of budgets and accounts, faulty quality of activity reports...), and concludes that failure awaits "the GIPs imposed on the partners from the outside, or that operate on a purely ad hoc basis."

Its Structure

The CNER consists of 10 members appointed by a decree of the Council of Ministers for a period of six years. Half of its membership is renewed every three years. Its current members are: Messrs Christian Becle, academy rector and chairman of the Committee; Jean-Pierre Causse, former deputy general manager for research at Saint-Gobain; Michel Demazure, professor of mathematics at the Ecole Polytechnique; Pierre Joliot, professor at the College de France; Gastom Meyniel, honorary dean of the Clermont-Ferrand College of Medicine ; Jacques Dondoux, president of the Caisse

National de Telecommunications; Jacques Stern, honorary president of Bull; Jean-Francois Thery, government adviser; Roland Morin, legal adviser to the Court of Accounts; and Mrs Daniele Blondel, professor at the University of Paris-IX.

On the Right Track

A 1993 Civil Research and Development Budget of Fr53.7 billion, up 5.25 percent over 1992, national programs sometimes involving considerable social and economic stakes, a European future that has already become a reality for the most ambitious of these programs, such as the space program: Such is the nature of the responsibility that rests on the consultative "magistracy" that in the coming years will have the task of evaluating the operation and effectiveness of the scientific institutions, and controlling the overall balance of the French research effort.

Will the work of the CNER, whose creation was itself the work of 22 ministerial departments, rise to the challenge of this responsibility? To judge by these first analyses that its members have released to the public, the CNER appears to be well on its way to attaining its initial objective, which was to evaluate, on its own initiative or at the request of the Ministry of Research, "the organizations, programs, procedures, and specific institutions in the financing of which the BCRD is involved."

Whether it be a matter of appraising the soundness of the scientific and technological choices involved, the adequacy of the resources allocated to the programs and of the authorities responsible for their implementation, or the effectiveness of the cooperative team-ups developed with the private-sector enterprises, the CNER's expertise and recommendations bring to light many structural and organizational weaknesses, in a coherent and soundly reasoned manner, for each entity "aspiring to qualify as an up-to-date and evolutive organization."

Five other evaluations are currently in progress, concerning, respectively: The French Scientific Research Institute for Cooperative Development (ORSTOM [Office of Overseas Scientific and Technical Research]), three high-priority programs (Biotechnologies; Human Beings, Labor, Technologies; and Materials), and the Regional Centers for Innovation and Technology Transfers. Endowed with relative independence in the choice of its topics of study, the CNER affirms its intent to extend its purview to problems of a more general nature "which seem to it to be of singular importance in the present configuration of the national research system."

The ambiguity of the EPIC legislation, the dysfunctions the system of dual oversight entails for numerous research organizations, and the insufficiency of cooperation among the scientific institutions, are but a few examples.

French 1993 Electronics Industry Budget Discussed

93BR0055 Paris ELECTRONIQUE INTERNATIONAL HEBDO in French 8 Oct 92 p 3

[Text] In the field of electronics, the Ministry of Industry's 1993 budget allocation will exceed 2 billion French francs [Fr]. Over Fr330 million will go to the "Atout" [asset] group, which is made up of three assistance programs for SMEs [small and medium sized enterprises]: PUCE (the use of microelectronics), PUMA (the use of advanced materials), and LOGIC (promotion of in-house data exchanges). The HDTV [high-definition television] program will receive approximately Fr600 million, of which the greatest amount (approximately three-fourths of the funds) will go to Thomson. Approximately Fr350 million will be allocated to the JESSI [Joint European Submicron Silicon Initiative] program and Fr750 million to the Bull research program.

France To Amend Intellectual Property Rights Law

93WS0089B Paris AFP SCIENCES in French 15 Oct 92 p 19

[Article entitled: "Bill to Protect Software"]

[Text] Paris—National education and culture minister Jack Lang presented a bill to implement a 14 May, 1991 European Communities directive to the cabinet on 14 October. The directive offers legal protection for computer software and amends the intellectual property law. Here is the relevent passage from the Cabinet communique announcement:

"The 12 member states of the European Community have decided to harmonize their laws protecting literary and artistic property." The 14 May 1991 directive is the first to be issued on this matter. It aims to reinforce the protection afforded software authors, while making it easier to use computer programs.

Software has been legally protected in France since 1985. Consequently, the bill makes only the few amendments that are needed to the intellectual property law.

The rights of authors are spelled out in more detail. What software purchasers can do without the permission of the author is also spelled out. This will enable purchasers to do what they need to combine several software programs.

To combat pirating, infringement of a software program's copyright will be considered a counterfeiting offense. Any publicity for equipment that can be used to copy software in violation of copyright will be suppressed unless it mentions that the illegal use of such equipment constitutes counterfeiting.

Besides transposing the directive, the bill stipulates that the right to market a software program can be pledged as

collateral. This measure makes it easier for the information industry to secure bank loans, thereby improving the conditions under which it is financed.

1993 Dutch S&T Budget Priorities Presented

93BR0098 Zoetermeer WETENSCHAPSBELEID in Dutch Oct 92 pp 3-4

[Article by Michael van Wissen van Veen: "Infrastructure Will Be Preserved"]

[Text]

In-Depth Surveys Form Basis for Political Decisions

On 15 September, the government presented its annual state and departmental budgets to the Second Chamber. The science budget will be released in December, together with the Strategic Policy Document. The budget of the Ministry of Education and Science offers the key topics needed by the government for implementing the decisions of the Strategic Policy Document. In research and scientific policy, savings will be made by canceling or merging a few subsidy schemes. The scientific infrastructure will, however, not be touched.

In-depth area-related surveys will determine policy issues for the coming years. These surveys must produce information that can be used as a basis for making political decisions concerning areas to be promoted or cut back. Both social needs and scientific developments must be considered. The Strategic Policy Document will be released in December as the first result of the survey process, together with the science budget.

The budget for 1993 covers key topics for implementing the decisions of the Strategic Policy Document. The Dutch Organization for Scientific Research (NWO) has been given a new role. Research funding principles will be changed and both incentive programs and infrastructure investments will be implemented more coherently.

As policy for the coming years will emphasize preservation of the scientific infrastructure, investments in equipment and specific provisions for research will remain at the same level.

Reconsideration Survey

Savings made in areas of scientific research will amount to 12.8 million Dutch guilders in 1993 and, structurally, 19.9 million guilders as of 1998. These savings were made as a result of the findings of the Reconsideration Survey entitled "Subsidies for Other Scientific Research and Scientific Policy." The basis for the measures is that the competitiveness of the institutions will be preserved. The contributions made to international organizations will also remain at the same level, unless savings can be made. The most significant saving is the result of merging and cutting back on a number of incentive programs. Proceeds of this measure will be 11.8 guilders for 1993, rising to 12.7 guilders in 1997. The Program for Promoting Knowledge Transfer will be canceled.

The Reconsideration Survey has shown that expenditures for libraries and information services can be made more efficient by organizational changes, increasing the level of cooperation, and passing on costs to the customer. This will result in a virtual halving by 1995 of the government's contribution to the Dutch Office for Library Affairs and Information Services (NBBI). This contribution will be 1.6 million guilders in 1993 and 1994. From 1993, the 26-million-guilder subsidy for the main national libraries will be reduced by 1 million guilders. The Ministry of Education and Science provides funding for the three main national libraries: the Royal Library, the KNAW [Royal Dutch Academy of Sciences] Library, and the Delft Technical University Library. From 1994, contributions to the Clingendael Institute (700,000 guilders per year) will be stopped. From 1997, it is expected that 4 million guilders can be structurally saved from the contribution to CERN [European Organization for Nuclear and High-Energy Physics] in Geneva. The costs will be jointly borne by a number of countries during a lengthy period. The Dutch contribution to CERN in 1993 will be approximately 50 million guilders (as part of a total budget of 1.2 billion guilders).

1993 Budget: Ministry of Education and Science Expenses

Primary education	23%
Secondary education	18%
Vocational training and adult education	9%
Higher education	20%
Research and scientific policy	4%
Study financing	13%
Housing	7%
Other program-related costs, mandatory legal payments	4%
Ministry Overheads	2%

Dutch Research Colleges Receive More Government Funding

93BR0099 Zoetermeer WETENSCHAPSBELEID in Dutch Oct 92 p 23

[Text] Dutch Minister of Economic Affairs Andriessen has promised 17 million Dutch guilders to research colleges specializing in fluid dynamics, catalysis, and process technology. The funds have been granted because these schools play an important role within the business community. This funding over the next five years is in addition to normal funds provided by the Ministry of Education and Science.

The Ministry of Economic Affairs has reserved a total of 44 million guilders for promoting seven or eight research colleges. Each college will be assigned an advisory body including members from research institutes and companies that are involved in the specific research areas. With

this extra funding, Minister Andriessen gives the recipient research colleges more financial elbowroom, thus allowing them to assist more Ph.D. candidates in obtaining their doctor's degrees. The colleges will use the money to create extra places for researchers, to invest in equipment, and to organize courses, academic seminars, and visits from lecturers.

The fluid dynamics research college will be allocated 5 million guilders for studying liquid and gas flows. This type of research is useful to industry sectors such as hydraulic engineering, shipbuilding, and aircraft manufacture as well as for forecasting the dispersion of contaminated water and air flows. Delft Technical University handles all the secretarial work for four cooperating universities.

The research college for catalysis has been allocated 6 million guilders for the study of reactions in practically all types of chemical conversion processes (e.g., oil refining, sulfur removal, and engine exhaust scrubbing). Eindhoven Technical University is doing the secretarial work for the seven universities involved.

The research college for process technology has been allocated 6 million guilders. It focuses on chemical processes for the manufacture of specific products with the lowest possible cost, energy consumption, and waste generation levels. Twente University is acting secretary for the six universities involved.

ESA To Proceed With Columbus Program, Cooperate With Russia on Hermes

Granada Conference

93WS0105B Paris LE MONDE in French 12 Nov 92 p 10

[Article by special correspondent in Granada, Jean-Francois Augereau: "The European Space Program Overcomes Its Dissensions; The Granada Conference and the Columbus and Hermes Programs"—first paragraph is LE MONDE introduction]

[Text] After two days of tough negotiations, the European space ministers, meeting on 9-10 November in Granada (Spain), decided to start two programs—Columbus and its manned APM [attached pressurized module], and the DRS data-relay satellite—and to launch a large earth observation program. They also confirmed the "reorientation" of the Hermes program, and the fact that they were looking for cooperation with the Russians on this type of spacecraft.

At a two-day meeting in Granada (Spain), the European space ministers reached an agreement after "normally tense" negotiations. Budget austerity laid down the law and imposed realism. The Hermes space shuttle program supported by the French lost some of its substance. The Columbus station supported by the Germans lost its unmanned module component (MTFF [man-tended free flyer]) and its fate remains linked to that of the U.S. Freedom station. As for DRS, the data-relay satellite network which is the Italians' favorite, its mission seems less clear now that the first two program components have been reduced. In this context, the representatives of the European Space Agency's (ESA) 13 member states approved three resolutions.

International Cooperation

Two resolutions cover international cooperation and cooperation with the Russians. They were readily adopted during the morning of 10 November. One calls for the ESA to "look for ways" to make the data obtained by ESA programs available to developing countries. It also acknowledges that "carrying out the agency's programs during the next few years will promote the deepening of the long-standing cooperation with the United States, make it possible to pursue joint activities with Russia, and provide bases for closer cooperation with Japan."

Preserving European Industries

In addition to their good intentions, ESA members agreed to "expand and intensify this cooperation" with the Russian Federation during the period 1993-1995, in four fields: orbital infrastructure; crew transportation means; communication means associated with such orbital infrastructure; and missions on board the Mir station.

Although no figure was mentioned, a series of contracts worth 110 million accounting units (MUC—one accounting unit is worth 6.97 francs [Fr]) might be signed with the Russians for the next three years. Part of that amount (30 MUC) would be spent to explore the possibility of jointly designing a new space transport system based on the work already done for Hermes. Another part (45 MUC) would be used to finance two long-duration flights by European astronauts on board Russian facilities. The remainder would be spent on studies concerning the future space station that might be developed jointly by Europe and Russia by 2005-2010.

The part involving the Russians nevertheless remains quite subtle. Cooperation with them "should protect the interests of the member states' space industry, including in the launching service sector," the resolution indicates. This is an essential point, as the Russians are in a position to offer launches at unbeatable prices (see box below).

Financial Adjustments

The hardest to digest, for the ministers meeting in Granada, was resolution No. 1 concerning ESA plans and programs for the next seven years (1993-2000). Two problems plagued the debates on this "very risky resolution."

The first one involved the adjustment of certain member states' contributions. As a result of variations in their exchange rates, countries like Great Britain, Italy, and

Spain might have suffered an increase in the size of their participation to ESA, as expressed in accounting units. Solutions should be found to ease the transition during 1992 and 1993. This is a major problem. The amounts contributed by several countries has a direct impact on program contents. In addition, the ESA decision on this point might set a precedent for other organizations such as the ECNR [European Council for Nuclear Research], the OECD [Organization for Economic Cooperation and Development], etc.

The second point of this thorny financial dossier is the "industrial return." According to the French minister of research and space, Mr. Hubert Curien, who was also the conference president, a compromise was arrived at, under which member states might recover up to 95 percent of their budget contributions in the form of contracts signed with their respective manufacturers between now and 1994.

Programs Until 1995

These questions being settled, there remained to define the programs to be launched by the agency during the next few years. The negotiations were bitter. While the earth observation program (LE MONDE, 10 November), with a budget of 1.759 billion accounting units, was unanimously approved, the "Man in Space" project served as an arena for skirmishes among the agency's three main contributors. To such an extent that the German, French, and Italian ministers had to hold an informal meeting to iron out their main differences.

With Hermes, the French have launched a three-year 567-MUC technological development program[1]; they must now decide with their partners whether or not to continue the program after 1995. To achieve some sort of symmetry, they wished to adopt the same approach for the Columbus and the DRS programs.

The manned APM module of Columbus, which will be attached to the Freedom space station, will still be launched. It remains to be financed. For the time being, it is covered only 90 percent, compared with more than 100 percent for Hermes. France, while stating that it "did not want to freeze anything" concerning the APM, is said to have reduced its participation from close to 14 percent to a little over 10 percent, as it prefers to concentrate its efforts on the other facet of the Columbus program, i.e. polar platforms. As a result, the ESA should somewhat reduce the APM budget within the next two months (around 5 percent for the next three years), while some contributing countries might increase their participation to this program, worth 2,517 billion accounting units.[2]

As for the DRS satellite, to be launched in 1999, Mr. Jean-Marie Luton, the ESA general director, was given mandate to find other potential users for the satellite, e.g. the U.S. Freedom and the Russian Mir stations.

"Now that the war between the blocs is over, we had to get ready to cooperate on a worldwide scale," the German research minister, Mr. Heinz Riesenhuber, estimated. Meanwhile, the Granada conference enabled the Europeans to retrieve the situation. "To start again on well-defined bases," as Mr. Hubert Curien put it.

Footnotes

1. Including 55 MUC for research on the development of a rescue vehicle (ACVR [assured crew-return vehicle]) designed to bring back the Freedom astronauts in case of accident, and an intelligent refueling cargo (ATV [Ariane Transfer Vehicle]) to be launched by Ariane-5.

2. The Columbus program as a whole amounts to 3.556 billion accounting units.

Russians To Launch Satellites

93WS0105B Paris LE MONDE in French 12 Nov 92 p 10

[Article by Jean-Paul Dufour: "The Russians Want to Negotiate Their Entry on the World Satellite Launching Market"—first paragraph is LE MONDE introduction]

[Text] On Monday, 9 November, Russia signed its first contract to launch a western satellite, on behalf of the international telecommunication organization Inmarsat and at a cost of $36 million. A similar device will be launched by the European company Arianespace, for $62 million. The dumping prices quoted by Moscow (and Peking) to gain a foothold on the western market gave rise to strong protests from European and U.S. launcher operators. The Russians say they are willing to talk.

"Rules of the game" designed to "civilize" the world market of civil satellite launches will be one of the most important items of negotiation after the Granada conference. For many years already, the Russians have tried to gain a foothold by offering their launchers (LE MONDE, 20 June 1987) at dumping prices, sometimes 50 percent below European and U.S. prices. For a long time, western countries resisted, imposing embargo measures they claimed were necessary to protect "sensitive technologies" and comply with COCOM [Coordinating Committee on Export Controls] regulations.

Now that the Cold War is over, the situation has become intolerable. Besides, it is in nobody's best interest. "We cannot consider collaborating on large programs while fighting like dogs at commercial level," a western expert estimated. The Russians seem to have understood this and they intend to make the most of the considerable interest aroused by their many cooperation offers. For their part, Western countries will obviously counter with cooperation contracts (for instance, the contracts the ESA is about to sign with Moscow, worth 110 million accounting units, i.e. Fr770 million).

Limited Offer

The matter was mentioned by Mr. Youri Koptiev, director of the Russian space agency, during his recent

visit to Paris, where he met with his counterparts from the European Space Agency (ESA) and the CNES [National Center for Space Studies] as well as with Mr. Hubert Curien, the minister of research and space. "We agreed to pursue our talks in Moscow, with the participation of several of the interested parties, so as to give an international character to our negotiations from the start," Mr. Koptiev told us. A European space official confirmed, mused: "In fact, we were surprised to see the Russians formally invite us to a bilateral meeting that the Americans intended to have with them. We shall see what Washington thinks of it."

An agreement would enable the Russians to offer the same prices as their competitors. They are interested, especially considering that, as Mr. Koptiev acknowledged, "the market will remain very limited until at least the year 2000, and it would be completely thrown out of balance if new operators were to exert too sudden a pressure."

However, even carefully prepared, the official entry of the Soviet Proton and Zenit rockets on the world market (followed later on by the Chinese Long-March, and the Japanese H-2 rockets) will of necessity limit the market shares of Ariane and the U.S. Atlas, Delta, and Titan. We can expect very tough negotiations. Already, it took several years for the Americans and the Europeans to come to an understanding, after a long time during which they accused each other of unfair competition through subsidies (LE MONDE, 26 September 1990).

If we are to believe Mr. Charles Bigot, the Arianespace president, the Americans seem to be on the warpath again, favoring Russian and Chinese rockets at the expense of Ariane in international organizations. He was referring in particular to the contract signed by the Russians and Inmarsat on Monday, 9 September, which might soon be followed by another contract with Intelsat.[1] NASA is also said to be considering using two Russian Proton rockets to launch space probes toward Pluton toward the end of this decade.

Determined to succeed, the Russians claim they have plenty of time. "Our potential will be rather limited for the next four years," Mr. Koptiev said. "We have only one operational launch site and it can accommodate only nine to 12 Proton launches per year, which barely covers our own needs." Already signed and future contracts nevertheless contradict these soothing words.

Footnotes

1. Inmarsat (specialized in maritime transmissions) and Intelsat are the two largest commercial telecommunication satellite operators in the world. Both organizations are international cooperatives including respectively 65 and over 120 countries.

France: New R&D Budget, Priorities Reviewed

93WS0105C Paris LE MONDE in French 4 Nov 92 p 9

[Article by Frederic Bobin: "Mr. Curien Announced the Release of 200 Million Francs [Fr] to Relocate Research Centers"—first paragraph is LE MONDE introduction]

[Text] On Monday, 2 November, the deputies adopted the Ministry of Research and Space budget, amounting to 53.7 billion French francs [Fr], i.e. 5.25 percent more than in 1992. The Socialists were the only ones to vote for it. The RPR [Rally for the Republic], UDF [French Democratic Union], and UDC groups voted against it. The Communists abstained. Mr. Curien announced that he would release Fr200 million to help with the "relocation" of public research organizations.

Let us admit that we are delighted. Let us rejoice with Mr. Hubert Curien, the minister of research and space, to see French science "honored" with the award of two physics Nobel prizes successively to Messrs Pierre-Gilles de Gennes and Georges Charpak? Everybody, of course, had paid homage to them. But although Mr. Claude Biraux (UDC ally, Haute-Savoie) declared himself pleased by this "euphoric scientific context," he went on to emphasize, by contrast, the "depressed budgetary context" that goes with it.

Obviously, depending on who quotes them, figures do not necessarily agree. According to Mr. Curien, the 5.25-percent increase in current expenditures and program authorizations is greater than the increase for all state budget appropriations taken together. "Manipulation," Mr. Jean-Francois Mattei (UDF, Bouches-du-Rhone) retorted. According to Mr. Mattei, this percentage is "artificial" because it is the result of "changes in items listing," as some items used to be charged to the defense and to the economy and finance budgets. If we disregard the effects of these changes, the increase is only 3.87 percent, Mr. Mattei indicated. Worse still, he noted that, item by item, aeronautical, electronic, and nuclear-power programs suffered some "erosion," so that, he said, "the dismantling of the Atomic Energy Commission (CEA) seems well on its way."

The Minister's "Disappointment"

Mr. Curien did not conceal his "disappointment" at being unable to bring the research and development budget above the oft-wished-for level of 3 percent of the gross domestic product. By way of consolation, he noted that such disappointment "was still more cruel" in other countries. At any rate, he chose to emphasize that his budget gives top priority to public research, with the creation of an additional 470 jobs, including 230 researcher positions.

However, Mr. Pierre Bourguignon (PS [Socialist Party], Seine-Maritime), the finance commission special reporter, and Mrs. Muguette Jacquaint (PC [Communist Party], Seine-Saint-Denis) pointed out that, for the time being, the government must tackle an urgent task: the

public research organization relocation program decided in January, which affects 8,000 people, including 2,700 researchers. In order to answer their concerns, Mr. Curien introduced an amendment to release Fr200 million—from the Research and Technology Fund (FRT)—to help "relocate" these employees. It was this concession that eventually caused the Communists to abstain from voting on all of the ministry's appropriations.

The second priority, Mr. Curien indicated, is to support space programs; appropriations for these programs will be 7.5 percent higher than in 1992. Finally, appropriations for technological development and industrial research, which were promoted to third priority, were increased by 5.6 percent. Mr. Curien mentioned the tax subsidies, especially the research tax credit, granted to companies. But these liberalities did not please Mrs. Jacquaint who felt that the government "is increasingly distributing funds to companies without wondering what they do with it," while the "situation of public research organizations deters young people from turning to research."

France: Technology Transfer Center Described

93WS0116A Paris COMPOSITES ET NOUVEAUX MATERIAUX in French 28 Oct 92 p 2

[Article entitled: "A2I, The Technology Transfer Center for CEA (Atomic Energy Commission) Materials"]

[Text] A2I, or Industrial Interface Shop, is the center that exploits research performed in the laboratories of CEREM, the materials department of the CEA. The 20-person center has been open since 1 January 1990, and is striving to demystify the CEA's image by acting as an interface accessible to one and all. "We want to scrap our image as a big, unapproachable organization involved only in nuclear research," explains Gerard Gibon, project manager at A2I.

Several departments were set up to prevent the center from getting lost in the meanders of the CEA. One of them is the DTA, or Advanced Technologies Department, which has housed the Materials Research and Studies Center (CEREM) since 1990. CEREM specializes in the fabrication and forming of materials, surface treatment and modification, the collection, characterization, and rating of materials, and non-destructive defect inspection. Its work has applications in many industries, including aeronautics, automaking, machines, biotechnologies, textiles, and pulp and paper, among others. Engineers at A2I identify and analyze industrial needs, and try to find the most appropriate way to meet them. "We start by studying the problem raised by the manufacturer and trying to find the best solution inside CEREM. If it is beyond our expertise, we look for the answer in all of the CEA's laboratories," says Gerard Gibon. A2I also offers a service that prepares applications to obtain subsidies from public organizations like ANVAR [National Agency for the Upgrading of Research]. "Small and medium companies account for about 30 percent of all the contacts made by the Industrial Interface Shop. Generally speaking, it is fairly big companies that seek out our know-how." A2I's activities thus range from simple consulting to process transfer, which can be done through the sale of patents or through licensing agreements.

A Transfer to a High-Technology Company

According to Gerard Gibon, "most of our contacts are made through shows, technology scholarships, Chambers of Commerce and Industry, CRITTs [Regional Center for Innovation and Technology Transfer], and regional ANVAR delegates; a significant portion come from organized prospecting." One example of a successful transfer is the one the CEA made to a high-technology company, Bull Peripheriques. It concerned a way to improve the 1,500-hour life of the company's print drums, which are worn down through abrasion. The CEA began investigating the problem in 1984, and first performed a feasibility study on a sample in the specialized laboratories of the Department of Materials Research. In 1985 the material and process were rated on 100 drums, which was followed by a preindustrialization phase from 1986-87. Bull Peripheriques incorporated the process and bought the machine in 1989.

A2I, Telephone: 76 88 35 11; Fax: 76 88 51 33

EC Electromagnetic Compatibility Directive Approved

93BR0115 Paris ELECTRONIQUE INTERNATIONAL HEBDO in French 29 Oct 92 p 30

[Article signed J.-C.G.: "Manufacturers Have Four Years To Adopt the European Standard]

[Text] An amendment gives industries four years to implement the European Directive on Electromagnetic Compatibility [EMC].

As of yesterday, 28 October, Directive 89/336/EEC on electromagnetic compatibility is legally enforceable in each member state of the European Community. As foreseen, and by request of the British Department of Trade and Industry, Amendment 92/31/EEC (adopted 28 April 1992 and published 12 May 1992 in the EC's OFFICIAL JOURNAL) allows for a four-year transition period during which manufacturers can market products conforming either to the EMC directive (then labeled EC) or to national regulations in force before 30 June 1992. As noted during the Euro-EMC Congress held in the London outskirts of Esher this month, manufacturers have everything to gain by adhering to the EMC legislation in the development of their new products; they avoid risking top-to-bottom revisions in a few months. To avoid breaking the law and risking their products being barred from the market and fined, the simplest method of proving conformity of equipment is by auto-certification. This is done by submitting the products in question to certain standard tests, either performed on-site or by requesting the assistance of third-party

organizations. Clearly, the Directive gives responsibility for coordination and technical standards to CENELEC, the European Committee for Electrical Standards. As a general rule, these standards follow guidelines from CISPR, the Special International Committee for Radioelectrical Interference, a subcommittee of the International Electrotechnical Commission (IEC).

Specific Directive for Wireless Transmission Equipment

In the absence of a specific standard or in case of the impossibility of submitting a product to any given test, another option is to draw up a technical file for consultation by the relevant authorities (the IEC and, in France, the LNE [National Testing Laboratory]). This type of certification implies the file is able to demonstrate the equipment's conformance. In the file, one must describe the steps taken to ensure electromagnetic compatibility and include the report of a technical expert. For wireless transmission equipment, there is a specific directive, reference 91/263 EEC. Once conformance has been demonstrated, a declaration can be made and the European Community label tacked on the product. The fact remains though, that for many manufacturers currently with neither the means for the tests nor even the necessary expertise to undertake such procedures, this transitory period is really a grace period. These four years should be used constructively in order to complete the standards, particularly for equipment's immunity to interference, which remains ill-defined, and also for those relating to major installations such as telephone exchanges or railway operations equipment.

Belgian R&D Spending Considered Low

Corporate Spending

93BR0116A Brussels LE SOIR (ECO SOIR supplement) in French 23 Oct 92 p 3

[Article signed O.B.: "Belgian Companies: Trailing Their Competition?"]

[Text] In Belgium, we have two accepted areas of competence: research in what we call broadband networks and in microelectronics. On a worldwide scale, the Alcatel group has no fewer than 13 privileged research sectors. Alcatel Bell is not doing too badly. We have also measured the productivity of Belgian researchers, who turned out to achieve above-average productivity levels.

Martin De Pryker, director of Bell Telephone's Research Center, can afford to be proud. Alcatel Bell has just made a major scoop with the launching of its PX, the intelligent telephone exchange destined for the organization of telecommunications in the private home. This is a product for which their research prowess lies more in cost reduction than on the actual technology.

Martin De Pryker can afford to be proud because Bell Telephone (which represents 80 percent of Alcatel Bell's turnover, i.e., 26.8 billion Belgian francs [BFr] in 1991) is in a particular position in the Belgian research and development field, with over 25 percent of its turnover being plowed into R&D. This ratio has in fact increased over the past few years.

The Public Authorities Invest Little

Are the undeniable efforts of Alcatel Bell hiding the forest from the trees? Belgium is quite often singled out in international reports for its lack of commitment to R&D investments (or spending), even though it is difficult to form an accurate impression with the latest available national statistics dating back to 1988. Scientific policy has been split into regions, and the federal entities have still not been put into motion.

"The low level of investment in research and development in Belgium is mainly a consequence of the weakness of government R&D spending. Belgium spends 45 percent less on R&D than the governments of its principal commercial counterparts. If one takes into account the efforts made in the private sector, the perspective is totally different. Compared to the average spending of their principle commercial partners, Belgian companies invest 13 percent more on research and development," points out Alain Lesage, director of the Economics Department of the Walloon Union of Companies.

An evaluation of the R&D effort undertaken by companies should take into account the nature of Belgian industry, characterized by the small size of companies and of the importance of small and medium-sized enterprises. It is, therefore, hardly surprising that research and development spending is concentrated mainly within the Top 100 companies. After the electronics sector, in which Belgium is more or less absent, the chemicals sector has a clear lead. Companies like UCB [Belgian Chemical Union] and Solvay have always targeted their strategies on value-added research. Over the last four years, we have seen their R&D spending increasing faster than their turnover (+19.3 percent compared to a status quo for Solvay and +37 percent compared with +30 percent for UCB).

Sharing the Fruits of Science

This effort will not lessen despite the continued delay in economic recovery. As Georges Jacobs, president of the board of directors of UCB, was saying in no uncertain terms yesterday afternoon at the general meeting of the Walloon Union of Companies, technological innovation is not a luxury but a condition for survival for companies confronted by a highly competitive environment. It should, therefore, figure amongst the priorities of company directors. Are the resources not what they should be? Georges Jacobs launches an appeal for a deterministic and selective R&D policy. The first response to the deficiency consists of scrupulously targeting research sectors in function of one's strengths and knowledge of the market. The second response boils down to one word: synergy. Synergy with other companies, with the universities, etc.

Also remarkable is the performance of the pharmaceutical sector (approximately 10 percent of the total spending by Belgian companies), where one finds UCB and Janssen Pharmaceutica, which literally stands out with 20 percent of its turnover committed to R&D (a ratio widely found within the sector).

Behind the big guys in research, the smaller companies are obliged to pool their resources to remain in the technological race. For this reason, the Union of Collective Research Centers (UCRC) brings together 13 independent units, covering sectors as wide ranging as wood, construction, gas, or textiles. Representing a pool of 1,200 specialists for a global budget of BFr3.2 billion, the UCRC plays the role of technological center for a host of companies responsible for BFr2,600 billion and 610,000 jobs. The virtues of partnership are never better understood than when one is small.

Government R&D Spending

93BR0116B Brussels LE SOIR (ECO SOIR supplement) in French 23 Oct 92 p 4

[Article by Marc Charlet: "Public Authorities to the Rescue of Companies"]

[Text] Financial aid supplied by the public authorities for industrial research is a type of aid that even the most hardened liberals have never disputed. No more so than the Japanese groups who built their expansion on the massive support of the famous MITI [Ministry of Industry and International Commerce] and their American counterparts, who benefited greatly from their government's military and space programs.

Are Belgian industries blessed with such an incentive policy? Budgetary restrictions and the institutional restructuring of the country will certainly not mark the end of the century of affluence.

As a result of the diverse laws governing regionalization, the role of the central government voided itself of almost all substance in Belgium. It is true that some significant funds are still being plowed into companies, but can we really call this aid for research and development? In the space technology field, for example, the billions paid by our country to the European Space Agency find their way back to some of our leading technological companies (Spacebel Instrumentation, AMOS [Advanced Mechanical Optical Systems], Sonaca, ETCA [Space Technology and Construction Studies], CISET, etc.) in the framework of supply contracts for goods and services by virtue of a "law of return" tacitly agreed upon.

The same is true of the Airbus program. Funding aims only to compensate for increased competition (the dollar is the referred to currency) or to finance the modernization of the model currently in production. Research in this sector actually takes place outside of the country.

At the national level, IRSIA [Belgian Institute to Stimulate Scientific Research in Industry and Agriculture] has little left in its program, except for some small remnants of contracts signed in better times. The torch has been picked up by the regions, in terms of aid for applied research. In Wallonia, the budget climbed to just over BFr1 billion in 1991 for companies alone. Excluding funding to universities or collective research centers such as GRIF (metallic manufacturers) or INISMA (neoceramics), the figure is just under a billion.

The bulk of this first figure is allocated to companies in the form of repayable loans—on the condition that the development research leads to the commercialization of the finished product. In quantitative terms, it is naturally the large organizations that get the lion's share. Simply by the nature of things, it is they who, in absolute terms, supply the most intensive R&D efforts. Many have in fact given their research centers in Wallonia separate company status, such as SmithKline Beecham, Cockerill Sambre, Shell, and Petrofina.

Special Effort for Small and Medium-Sized Enterprises [SME]

Nevertheless, dozens of SMEs, a majority of which are Belgian, find themselves allocated repayable loans each year. This allows them to position themselves in profitable market niches, such as design software (with companies such as Star Informatic, Sircad, Polyflow, or Samtech) and medical electronics (such as Ion Beam Applications).

With the remaining funds the Walloon region has established a diverse range of financial incentives (nonrepayable this time) reserved for SMEs: aid for the recruitment of an engineer responsible for technological innovation; for the realization of technico-economic studies; for technical support; for the preparation of international technological joint ventures.... All these types of aid are specially adapted for companies where innovation and R&D functions are not yet solidly in place.

Another original initiative taken in the Walloon region is the FIRST program, one of the exquisite instruments for reinforcing links between universities (including industrial institutes of higher learning) and companies. This program puts the emphasis on training by bringing together young researchers, companies where they can get training, and university laboratories. The region takes care of the researcher's salary over a period of two or three years. Almost 100 grants have been allocated or are in the process of being allocated by FIRST.

A Feather in Wallonia's Cap

The successive regional governments in Wallonia have set up a wide-ranging aid program to favor R&D in the south of the country. This aid package represents between 5 and 10 percent of efforts made in the private sector. Does this mean that the two other regions [Flanders and the Brussels area] are lagging behind? This is difficult to ascertain as long as the regulations change from year to year. For example, the Flemish region at one time removed and then reinstated the possibility of

providing aid for fundamental industrial research. But it appears that on the whole, Wallonia has provided its companies with much larger and more substantial financial incentives than its counterparts in the central and northern parts of the country. This is a policy that has proved successful, given that companies in Wallonia provide research efforts very near to their share of industrial salaried employment.

The regional government is not the only door on which companies seeking a helping hand can knock. Another source of aid is the European Commission with the ESPRIT [European Strategic Program for R&D in Information Technologies], BRITE-EURAM [Basic Research in Industrial Technologies for Europe - European Advanced Materials], RACE [Research in Advanced Communications for Europe], or ENERGY programs covering wide areas of industrial activity. Aid from these sources is limited to research falling within well-defined fields and within the framework of international collaboration. Is this a constraint hard to overcome? In any case, 40 or so companies based in the southern part of the country have joined the European programs to date. This seems like few, but it appears that, globally, Belgium obtains advantages from these programs at least equal to its financial contributions, although no official balance sheet has yet been published (the rule of equal return is not applied at the EC level). This is true at least for Belgium but what about Wallonia?

EC Evaluation Board Calls For Cancellation of RACE, ESPRIT

93BR0117 Rijswijk POLYTECHNISCH WEEKBLAD in Dutch 22 Oct 92 p 1

[Article: "Destructive Verdict on Technology Programs"]

[Text] Two important European technology programs, ESPRIT [European Strategic Program for Research and Development in Information Technologies] and RACE [Research & Development in Advanced Communications Technologies in Europe], should be abandoned. These showpieces for the European Commission contribute too little to the competitive power of the European information technology industry, according to a confidential note from the Information and Communications Technologies Review Board.

The Council, whose chairman is Philips top man Wisse Dekker, evaluated the information technology research programs on behalf of the European Commission. Dekker states without mincing his words that the RACE telecommunications program should be closed down. The aim of RACE was the development of a European broadband network. It has been unsuccessful because too much effort went into the standardization of telecommunications techniques.

According to Dekker, the European telecommunications markets must be further liberalized before there can be any question of a broadband network.

The criticisms of ESPRIT II are very clear; in contrast to RACE, Dekker suggests that here R&D should continue in another form. In order to be able to serve the distressed European information technology industry better, R&D must be market-oriented. At the moment, ESPRIT II is too far removed from daily practice. One of the reasons is the explosive growth in participation by the universities. No less than 81 percent of the projects have a university participant.

French Industry Minister Increases Aid to Semiconductor Industry

93BR0141 Paris ELECTRONIQUE INTERNATIONAL HEBDO in French 5 Nov 92 p 5

[Interview with Dominique Strauss-Kahn, French minister of industry, by Jean-Pierre Della Mussia: "Let's Create Condition for Good Growth"]

[Text] SGS-Thomson has every chance of receiving a substantial injection of capital from state-controlled companies before the end of the year. Minister for Industry Dominique Strauss-Kahn kindly agreed to describe the semiconductor "Crusade" on which he embarked some 12 months ago.

Della Mussia: If you were to classify the objectives of public sector initiatives with regard to semiconductors, how would you prioritize the following? Make it possible for all industries to have a powerful tool for innovation; Prevent that market-oriented industries (semiconductor users) fall short of semiconductors in the event of a world crisis; Redress the commercial balance in the supply of components; Establish a state-of-the-art industry, as one amongst many.

Strauss-Kahn: Public sector initiatives consist of creating favorable conditions for industrial development by enhancing its infrastructure and, where possible, of redressing any imbalance in market conditions.

The initiates taken in regard to semiconductors address these two objectives:

—In the first instance, this is necessary because the semiconductor industry in itself serves as an infrastructure for the development of a large part of industry as a whole.

—In the second instance, because it is clear that the prerequisite of an open international market has not yet been achieved: The Japanese consortia invest massively in their semiconductor divisions, but it is blatantly obvious that criteria for profitability have not been taken into account.

Moreover, the Japanese market remains virtually inaccessible to European manufacturers, whereas Europe is wide open to them.

Thus, if we come back to your list, the cardinal objective is to ensure industry a good supply of semiconductors. The motivation is not the potential supply shortfall, but

the danger inherent to the need to subcontract components (e.g., ASICs [application-specific integrated circuits]) which incorporate more and more added value and know-how of manufacturers of finished products.

In a certain sense it is also a "tool for innovation." One of the priorities of our initiative is to address this problem in the context of European cooperation.

Della Mussia: The German minister of industry believes that, before a semiconductor industry can develop and produce original products, it must first have strong and innovative industrial customers who order large volumes of components. Public sector initiatives should, therefore, target these semiconductor-purchasing industries, in the first place. How do you react to that?

Strauss-Kahn: We have no reservations with regard to these industries, quite the contrary. From our perspective, vertical integration is one of the Japanese strong points. In Europe, becoming conscious of the mutual interdependence of semiconductor manufacturers and end users in a climate of solidarity is a "burning obligation." This is particularly true for SGS-Thomson, which is the least integrated of the major integrated circuit manufacturers.

It is with this in mind that more than one-third of our contribution to the JESSI [Joint European Submicron Silicon Initiative] program is dedicated to supporting "applications" objectives. Thus, having said that, the German analysis with regard to this subject is not incontestable: It focuses on standard circuits and completely ignores the strategic nature of certain integrated circuits for the end users. This analysis, by the way, falls far short of enjoying unanimity in Germany.

Della Mussia: Given the relative modesty of the funds to be committed, would it not be wiser to use this money on innovation-oriented projects with a significant risk factor, if need be, rather than on an operation which, according to some, since 1978 is just to catch up to "current world level" technology?

Strauss-Kahn: First remark: The funds allocated to this sector are not all that modest! In 1992 the JESSI program represented a public expenditure of ECU200 million, of which slightly more than one-fourth came from the EC, one-fifth from Germany, and one-fifth from France. Globally, our support of microelectronics R&D is in the region of 0.5 billion French francs [Fr] per year. This is somewhat more than "relatively modest," especially when we recognize that this is part and parcel of a European effort.

Second Remark: Of what use is innovation if we do not have the techniques to industrialize and commercialize the products that result from this innovation? It is unthinkable for an advanced industrial society, such as France, to content itself with simply being a research center. We need to master the technologies that allow us to produce the advanced products which we conceptualize and design. Furthermore, I beg to differ; it is inexact to suggest that we are lagging significantly behind in the technical arena in Europe. Two examples relating to SGS-Thomson:

—The introduction of 16-Mbit EPROMs [erasable programmable read-only memories] was noted as one of the top three innovations in the world. In its product range, SGS-Thompson is actually one of the world leaders.

—Very few companies in the entire world can boast production facilities for 200-mm silicon wafers, such as the one that will come online in Crolles at the end of this year.

Finally, support was given to applications projects (digital radio, automobile safety,...) involving initiatives which were not without technological and industrial risk.

Della Mussia: Specialists estimate that it is necessary to capture at least 5 percent of the world market to be considered a major player in semiconductors and not to loose money. Could this still be one of the objectives for SGS-Thomson?

Strauss-Kahn: There is no conclusive correlation between market share and profitability in this sector; this depends on many factors, notably the product portfolio (note the profitability of Intel, which benefits from a near-monopoly of an indispensable product) and the capacity to master productivity. There are companies which have a market share approaching this 5 percent benchmark, which nevertheless are marking losses far in excess of those of SGS-Thomson.

It is true, however, that the high investments in R&D and production require a certain critical market share. This is the motivation behind the various alliances being established in this sector. It is obvious that SGS-Thomson cannot remain impervious to this trend.

Della Mussia: Is it imperative, in your opinion, that almost banal circuits be mass-produced in Europe? Is it not, at times, expedient to confine production to low-cost countries where labor costs are more competitive?

Strauss-Kahn: Actually, "banal" lower-level technology products can no longer be competitively produced in Europe. SGS-Thomson carries out one-third of its production in Asia. The remaining two-thirds are still confined to countries with high labor costs, principally France and Italy.

Nonetheless, production in Europe remains possible, even necessary, for advanced products and for the most advanced technologies. It is also justified by the need to stay close to clients, as evidenced by the foreign groups that have decided to invest in our country.

Della Mussia: The French automobile industry continues to invest heavily because it feels partially protected by the imposition of import quotas on the Japanese for a certain length of time. Do you not believe that

you would rekindle a desire to reinvest in our consumer electronics industry, if it enjoyed comparable conditions?

Strauss-Kahn: A certain number of quotas are still in existence in France with regard to consumer electronics imports (radios, color TVs) that come from certain countries (Japan, Korea, Taiwan, China, etc.). These quantitative restrictions are of limited effectiveness today, given that a large number of Japanese and Korean factories have decentralized production by establishing units in the EC and in Southeast Asian countries that are not subject to the quotas (Malaysia, Singapore...). The political price required to maintain or enforce these measures appears disproportionate to the economic stakes. It does, however, seem apparent that removal of quotas will serve only to increase the permeability of the French market, which is already considerably high. (In France, the market penetration level through imports is 75 percent). Furthermore, new import regulations (primarily suppression of customs clearance on certain goods in other EC countries) can but bring added pressure to bear on prices that have already been in free-fall for a number of years. (This phenomena has been accentuated in the period 1991-1992, due to market recession.) This will have negative repercussions on profit margins, and thus on revenues, of French and European manufacturers.

We could envisage replacing these national quotas with degressive community quotas, comparable to those practiced in the automotive industry. This idea may seem appealing at first glance; however, it does come up against certain grave obstacles.

—As has already been stated, the two industries are significantly different. The number of Asian *transplants* in Europe is already rather high in the consumer electronics sector. The number in the automotive industry is more modest. For this reason, the imposition of a quota system will have only limited effect. Furthermore, the level of market penetration by Japanese brand names in the area of consumer electronics is very high. This is not so in the automotive industry. Here it was possible, from a very low starting point, to plan a progressive increase.

—By virtue of the limited number of member states involved in consumer electronics, France would find itself isolated if it adopted such a strategy.

French Industrial 1993 Research Budget Increases

93BR0156 Paris INDUSTRIES in French Nov 92 p 7

[Article by B. de la Fonchais: "Industrial Budget Increases by 3.5 Percent"]

[Text] With 19.38 billion French francs (Fr), the draft budget of the Ministry of Industry and Trade increases by 3.5 percent compared to the past year. The increase will be close to 5 percent if one includes the Fr260-million stock transfer from public sector companies which will affect the Thomson and Bull companies. The budget is based on two priorities: continuation of the effort to improve business competitiveness, and increase of resources in support of industrial change. Credits to promote industrial research rise about 14 percent to more than Fr8 billion, if the research tax allowance is included. The "Atout" [Trump] program for SMEs [small and medium-sized enterprises] should see its credits increase by close to 15 percent, while ANVAR's [National Agency for the Implementation of Research] aid to innovation program gets more than Fr1 billion. Support for major national and international technology projects will be on the order of Fr3.3 billion. The increase in credits linked to industrial reconversion and restructuring is substantial, exceeding 40 percent to reach Fr718 million. The budget also provides for the development of training through the "Ecole des Mines" [engineering schools] network. Additional resources will be allocated to nuclear safety and to preparations for European Single Market standardization.

JESSI Director Requests Program Extension, Budget Increase

93BR0210 Amsterdam COMPUTABLE in Dutch 20 Nov 92 p 14

[Article: "JESSI Top: More Money Needed Together With Extension of Program's Duration"]

[Text] Munich—Raimondo Paletto, the top man in JESSI [Joint European Submicron Silicon Initiative], is pushing for the extension of the advanced chip technology program. Officially, the research project runs until 1996. Paletto would also like to see the provision of more EC funding. "The future of the European microelectronics industry is closely allied to product innovations based on chips," said the JESSI board chairman during the "Electronica" exhibition in Munich.

According to Paletto, by the end of this decade microelectronics will have reached the height of its possibilities. It will give rise to many new products such as those which have already been identified by programs like JESSI. Building on the "information era" foundation, microelectronics will ensure the well-being and prosperity of Europe. Forecasts by the OECD [Organization for Economic Cooperation and Development] show that electronics will dominate every other branch of industry in Europe until the year 2000.

Paletto stressed that JESSI has stimulated the transfer of basic information by means of its cluster-wise and flagship approach. As an example of major results, he cited the development of common chip architectures, the joint development of basic chip technology, the pooling of materials and product equipment, the harmonization and joint specification of chemicals and materials. In addition, interfaces have been defined between participating semiconductor manufacturers, such as in the "Joint Logic Project" and the "Manufacturing Science Project." According to Paletto, JESSI is now on the right

track following last year's changes, whereby the emphasis was placed on essential matters.

During the Munich electronics exhibition, the JESSI organization presented a thorough evaluation of results achieved so far and the program's progress. According to R. Kramer of Philips, the JESSI "Technology" program has resulted in fruitful cooperation between European chip manufacturers. In the area of CMOS [complementary metal oxide semiconductor] technology, for example, excellent progress has been made. These particular chips are necessary for European projects in the fields of HDTV [high-definition television], digital audio radio broadcasts, car electronics, mobile telephony, and broadband communications.

Remarkable results have also been obtained in the "Equipment and Materials" subprogram. However, E. Kamerbeek of ASM International in Bilthoven [the Netherlands], said that European manufacturers of equipment and materials for the semiconductor industry are going through difficult times. The future of this part of the industry depends on a healthy chip industry, which needs the most advanced type of equipment in order to be able to produce the next generation of chips.

Development costs will, however, be too expensive to be carried by the medium-sized industry itself. Kamerbeek is afraid that, with a limited number of semiconductor manufacturers in Europe, the demand will be on too small a scale. If only small numbers of systems can be manufactured, it will be difficult to continue with the development of new prototypes. Kamerbeek is, therefore, also asking for new methods of financing.

The JESSI subprogram for "Fundamental and Long-Term Research" has been only partially carried out due to financial problems. Resources will also remain scarce in the future. One ray of light is that, despite this handicap, the academic and industrial research centers are managing to work together effectively.

CORPORATE ALLIANCES

DASA, Fokker Merger Finalized

93MI0091 Bonn DIE WELT in German 28 Oct 92 p 17

[Text] After months of tough negotiations, German Aerospace AG (DASA), which belongs to the Daimler Benz group, has completed its takeover of the venerable Dutch aircraft manufacturer Fokker. "We expect the contract to be signed by Tuesday at the latest," the Trade Ministry in the Hague told DIE WELT yesterday.

It is emphasized that DASA, Fokker, and the Dutch government, which holds 32 percent of the Fokker shares, are reported to have reached agreement on all the outstanding issues, including the sale price. As DIE WELT learned from Fokker sources, this will be "just under the 40-guilder mark for each Fokker share." This means that DASA is prepared to pay about 900 million guilders for its majority stake in Fokker.

Despite worsening economic conditions, DASA will be reporting an operating profit but a slight net loss for 1992. The Munich-based Daimler Benz subsidiary thus gives the lie to rumors that the aerospace and defense group has run up an operating loss of 600 million German marks [DM].

While the DASA subsidiary Dornier and the massive slump (up to 30 percent) in defense contracts in particular represent a constant financial drain, the hastily achieved inclusion of German Airbus GmbH in DASA's consolidated balance sheet is already having a positive effect: This Hamburg-based DASA subsidiary has contributed some DM400 million to the DASA results and raised the group's sales income by about DM18 billion this year.

As not all the details of the Fokker-DASA deal have been announced yet, the question of the future of the F50 remains open: production of this Fokker turboprop aircraft, which has not proved an outstanding market success, could be discontinued in the medium term. One thing is clear: As a part of the DASA organization, Fokker will retain system leadership for the building of medium-range 65- to 130-seater jets, while, as majority shareholder, DASA will be responsible for strategy and industrial leadership.

Top German Software Firms in Technology Exchange

93WS0117A Paris PRODUCTIQUE/AFFAIRS in French 1 Nov 92 p 2

[Article entitled: "Alliance of Germany's Top Two Software Companies"]

[Text] Germany's top two computer software companies, Software AG and SAP AG, announced in Prague that they had signed a joint agreement to collaborate technically and exchange technology in their fields. Software AG, which is headquartered in Darmstadt and employs 4,300, specializes in basic software. The firm posted sales of 712 million German marks [DM] in 1991, up 22 percent over the previous year. SAP AG is headquartered in Waldorf, and specializes in software packages for financial management. Its turnover in 1991 jumped 140 percent to 2.5 billion French francs [Fr], notably through the sale of integrated software packages, which are attracting more and more users the world over. What is more, the SAP group enjoys a net profitibility of 17.5 percent. The technological pairing of these two groups, each of which is the European leader in its field, will enable them to expand their market further. Most important, it will allow them to achieve synergies in developing new technologies and to share the enormous cost of research.

German Machine-Tool Firms Uniting

93WS0117B Paris L'USINE NOUVELLE in French 29 Oct 92 p 40

[Article by Laurence Dequay: "Germany's Machine-Tool Industry Regroups"; first paragraph is L'USINE NOUVELLE introduction]

[Text] Japanese competition is triggering defensive reactions, and savings on fixed costs is one of the items on the agenda.

German machine-tool companies saw their orders dwindle over 20 percent in 1992, and their products discounted by as much as 30 percent. The magnitude of the economic slump and the need to resist fierce competition—notably from Japan—has prompted them to pair off.

Gildemeister (digital control lathes) and Deckel (milling machines), are the third- and fourth-ranked machine tool makers in Germany. They are merging their marketing departments. Bodo Viets, the president of Maho company (sales of 1.48 billion in 1991-1992), has announced the signature of a production and distribution partnership agreement with Traub, the fifth-largest company in the industry. Jan Kleinewefers, who is the new president of Germany's machine-tools federation, VDMA, hopes the Gildemeister-Deckel alliance will inspire many imitators.

Expanding Customer Bases

The two protagonists are creating a joint distribution firm in which each will hold a 50-percent capital stake. They estimate they will save 34 million French francs [Fr] on their fixed costs if they combine their sales departments around the best-performing existing organization. Gildemeister and Deckel have complementary product lines, and firmly intend to take advantage of the alliance to expand their customer bases, over two-thirds of which consist of small and medium companies. Together they will hold nearly 10 percent of the machine-tools market in France. "A useful strategy," admits the president of Traub Sonim France, Nicolas Prieure. Discussions between his group and Maho could prove trickier, since the two groups compete in the lathes market.

CORPORATE STRATEGIES

Possible Sale of Bavaria's Deutsche Aerospace Shares

93WS0083B Duesseldorf HANDELSBLATT in German 28 Oct 92 p 21

[Article by RTR/GW: "German Aerospace: Positive Operating Results: Bavaria Thinking of Selling Its Shares in German Aerospace"]

[Text] Munich, HANDELSBLATT, 27 Oct—The Bavarian state government is apparently thinking of selling its share in the aerospace firm, German Aerospace, Inc. (DASA), Munich. As Bavarian Finance Minister Georg von Waldenfels said in Munich, no offering has, of course, been made yet, but they have been "thinking about it out loud."

In view of the elimination of 7,500 of its approximately 70,000 jobs announced by DASA, it is crucial to these considerations "that there be no momentary annoyance." A share amounting to 8.58 percent is nonetheless "no sacred cow" for Bavaria.

Waldenfels said that a sale is certainly not something "which we will hastily throw together." Discussion of this is still in a very early stage. First, the value of the share package would have to be ascertained, then DASA or its parent company, Daimler-Benz, Inc., would have to inform them how much it is prepared to pay. (Based on DASA capital holdings of DM5.6 billion, the price for the Bavarian package might be estimated at about something under DM500 million.)

Personnel Shouldn't Be Eliminated One-Sidedly in South Germany

The finance minister explained that a withdrawal from the DASA board of directors is not synonymous with a loss of influence over the aerospace company's structural policy decisions.

Thus, DASA can only count on the further support of the Bavarian state government "if we don't happen to be taken to the cleaners." In connection with this, Waldenfels renewed his demand that DASA not reduce personnel one-sidedly to the detriment of southern Germany. There is, however, no disagreement with DASA president Juergen Schrempp with regard to conjectures about Gov. Max Streibl's annoyance with the planned cuts in jobs. Von Waldenfels said that, as far as he knows, there is also "no official DASA personnel reduction program." He expects that Bavaria will be heard before any such plan is implemented. DASA justified the planned reduction in force on the basis of declining orders in early October, especially in the armament industry.

A DASA spokesman emphasized that DASA will achieve operating results for the first time in 1992 that are positive measured in terms of the Daimler-Benz Company's standards. In so doing, he denied press reports that the Daimler-Benz subsidiary will have an operational loss of DM600 million. They will have to wait a while for the year-end results. It would, however, be sheer speculation to speak of a year-end loss at this time.

Structural, Export Problems of German Machine Tool Industry

93WS0083C Duesseldorf HANDELSBLATT in German 21 Oct 92 p 17

[Article by DP: "In Search of Forms of Innovative Joint Ventures"—first paragraph is HANDELSBLATT introduction]

[Text] Duesseldorf, HANDELSBLATT, Tuesday, 20 Oct—Industry trends, mechanical engineering: Hopes are centered on revival of the economy in Western Europe and North America, on new markets.

The German machine tool industry is still internationally regarded as a showcase industry. Its share of worldwide machine tool production came to at least 24.7 percent in 1991. Furthermore, machine tools are the "core of any industrialization," as Dr. Peter-Juergen Kreher, the chairman of the board of Friedrich Deckel, Inc., recently put it in a talk on the outlook for the German mechanical engineering industry. There is practically no product in whose net product chain no machine tools are involved. Access to new technologies in, for instance, the aerospace industry or in the automobile industry is only possible through new machine tools.

In Kreher's opinion, since 1990 the European machine tool industry has been in the throes of its worst crisis since the immediate postwar years. This is especially true for manufacturers of standard lathes and milling machines. Meanwhile, they have to cope with a penetration of their market of well over 40 percent. Even though German machine tool manufacturers together with the production of the new federal states were able to increase their share to 24.7 percent of the world market in 1991 (1990: 21.3 percent), the world market leader, Japan, was nevertheless able to further increase its lead. "Today, neither German nor other European machine tool manufacturers can still keep pace with Japanese producers' economic power," Kreher summed up the situation.

The development of "innovative corporate structures" is at present the most urgent task for machine tool manufacturers. These must not be mergers. Joint development or production companies up to and including a common sales and service network or joint purchasing can also be useful. Since there would no longer be any way to get around this, not only for volume suppliers, which have been striving to control costs with a broad range of products, shallow production depth, and a global marketing strategy, if the "Japanese campaign to capture the market" is to be stopped. In the longer run, this also goes for machine tool manufacturers, who could really claim leadership of the technology. Ever shorter production cycles with at the same time ever more complex technololgy and a higher rate of investment threaten to overtax the financial strength of German suppliers who fill specific niches.

In their assessment of the current economic situation, machine tool manufacturers are clearly preparing themselves more for coping with the crisis than for expansion. On the basis of the IFO Institute's survey of machine tool industry investments, the Association of German Machine Tool Factories, Inc. (VDW), reports that 11 percent of the firms wanted to invest 11 percent more in 1992 than they did in the preceding year and 27 percent of them exactly as muchas they did. On the other hand, 62 percent of the firms surveyed intend to invest less. Twelve percent of the firms gave as their chief objective expansion of their production capacity, 47 percent greater efficiency, and 41 percent the procurement of replacements.

Not All Machine Tool Manufacturers Overshadowed

The VDW anticipates a drop in production of at least 10 percent, a tendency that will continue in 1993 because of the poor situation with respect to receipts of orders. From January to August 1992 order receipts declined by 20 percent on the whole in comparison with the same period the year before. In July 1992 there were only enough orders for six months. The VDW estimates that the tendency toward further underutilization of production capacities will persist. In June 1992 83.3 percent of full capacity was utilized and in June 1989 a peak of 98.3 percent was recorded. In 1991 it averaged 89.7 percent. The reduction in the number of employees—98,000 employees at the end of 1991—will continue. This year the VDW anticipates a decline of at least 7 percent.

Not only the machine tool sector—the showpiece of the industry—but the whole German mechanical engineering and equipment industry is still in a "distinct demand trough," as the retiring president of the German Mechanical Engineering and Equipment Industry Association, Inc. (VDMA), Dr. Bertold Leibinger, recently described it at the 100-year VDMA anniversary celebration (HANDELSBLATT, 16-17 October 1992). With regard to this, the VDMA explained that the change in tendency in the export markets that was still anticipated at the start of this year has so far not materialized. Therefore, the original prognosis, that 1992 would result in a real production deficit of 1 percent, has to be revised to indicate a decline on the order of 5 percent.

"Without wishing to unnecessarily dramatize this development," the VDMA explained, "this would be the biggest deficit that machine production has had to swallow since 1976." Most mechanical engineering industries now complain about an underutilization of their production capacities. Construction and construction material machines, food and food-packaging machines, instruments, metallurgy and rolling mill equipment, and thermal process technology, whose production capacities are still well utilized, are among the few "winners." However, in these industries, too, orders are now in part declining.

However, the current order situation in broad sectors of the mechanical engineering industry is extremely unsatisfactory. During the first eight months orders declined by 5 percent on the whole, by 7 percent in Germany and by 2 percent abroad. The prospects for employment for the rest of the year and until well into 1993 are gloomy because of the poor order situation. Many firms are laying off people or trying to pull through with short time. In the opinion of the VDMA, hiring new workers is out of the question for most firms in the foreseeable future.

The reduction of costs and a reexamination of production depth are the permanent tasks that management is setting itself. The VDMA estimates that there may not be enough short-time work to cope with the employment and cost problems. A reduction in force of 80,000 workers in western Germany alone for 1992 must be expected. The net return on sales, which had already sunk to 1.8 percent in 1991, will drop to 1.2 percent and in the process reach an all-time low. Because of the poor order situation, production may begin to rise by mid-1993 at the earliest if orders, especially from abroad, flow more rapidly again during the coming weeks and months. A slight increase in production throughout 1993 should be possible, the VDMA hopes. With orders on the rise again and if they succeed in lowering costs, an improvement in returns on investment should also be possible.

New Market Prospects Increasing

"After two long-drawn-out, not yet by a long shot digested rounds of wage negotiations and against the backdrop of the problems in eastern Germany that are still to be solved, the mechanical engineering industry in both western and eastern Germany cannot take the strain of any additional costs without jeopardizing more jobs," the VDMA warns. Firms have cut back on their investment plans because of the difficult sales situation in Germany as well as on foreign markets. In the process small and medium-sized companies in particular will cancel their investment plans for the domestic market. The investments are clearly concentrated on greater efficiency and replacement. However investments in replacement will, at the same time, greatly contribute to the expansion of production capacities through the employment of new technologies.

For the mechanical engineering export trade, the crucial question is still: When will economic recovery in Western Europe and North America clearly take shape? But the present situation in which the German mechanical engineering industry finds itself is above all a mirror image of the western European machine market—of the by far most important sales market for German suppliers. In the estimation of the VDMA, the entire western European market volume for mechanical engineering products will probably shrink by about 4 percent in real terms. The next upswing for the mechanical engineering industry will probably not begin before 1993, "However, it won't really gain momentum before 1994."

Despite the present collapse of the economy, the VDMA optimistically says that "the mechanical engineering industry's medium-term chances of growth are still good." This theory is justified with the key words: Eastern Germany, European internal market, and European Economic Area (EEA). The new generation of computer-controlled machines is just beginning to become more widespread. It will trigger huge investments in modernization. Moreover, protection of the environment requires new machine technologies and even "Eastern Europe will be an interesting market again in the medium term."

DASA CEO Discusses Fokker Expansion Plans

93GE0100Y Duesseldorf WIRTSCHAFTSWOCHE in German 27 Nov 92 pp 198, 200-201

[Interview with Juergen Schrempp, DASA CEO, by Dieter Schweer and Wieland Schmitz; place and date not given: "'Into the Major League': How the DASA-Chief Wants To Expand Further in the Economic Downturn"]

[Text]

[WIRTSCHAFTSWOCHE] Mr. Schrempp, the aircraft market is in a nosedive worldwide and state expenditures for space operations and armaments are being cut. Is your job still fun for you?

[Schrempp] If you look at these external factors, then everything does indeed speak against my job at this time. And I also know that the next two years will also be very difficult. But aerospace is no business for the short term. You must look at time periods of at least 10 years and I am counting on respectable rates of growth—about 5 percent a year for large aircraft and even 8 percent annually for regional aircraft. Things will pick up again after 1994.

[WIRTSCHAFTSWOCHE] But only if business conditions improve worldwide. With the political situation being what it is and with the tight national budgets, however, aerospace budgets will probably tend to shrink further.

[Schrempp] We are prepared for a lasting weak demand for defense technology. As for space operations, I am satisfied: What has now been decided by the European ministers in Granada corresponds to our concept. At least the space laboratory Columbus will be realized, although it does not fly freely, and about 1 billion German marks [DM] were appropriated for the next three years for the space glider Hermes. That is sufficient to develop the technology further and to maintain our technological position. I consider the cooperation with the CIS to be quite important, which will cost the

western Europeans DM240 million. The decisions are based on the new strategic initiative that DASA presented.

[WIRTSCHAFTSWOCHE] But can the space business of DASA still grow in the present financial framework?

[Schrempp] We will be able to maintain our sales; employment will decline.

[WIRTSCHAFTSWOCHE] What will the support of the CIS do if the enterprises and research institutes there can hardly survive?

[Schrempp] I was recently there with a delegation and signed several joint projects. The technology that we found there exceeds our expectations. There are fields where the experts in the CIS are absolutely tops in the world. We must help them through cooperation to retain and further develop this knowledge. DASA has set up a special budget for this purpose. We are expecting a highly interesting transfer of know-how. The research budget of Minister [of Research and Technology] Riesenhuber includes an additional DM80 million for the development of this cooperation.

[WIRTSCHAFTSWOCHE] You are further expanding in the midst of a downturn and taking over the majority of the Dutch company, Fokker, which urgently needs money for new developments. Is this an additional long-term investment that promises only a small payback?

[Schrempp] Do you think that we would have reached this decision with Fokker, which is so important to us strategicaly, if all aircraft firms were earning a lot of money at this time? This admittedly difficult overall situation actually offers us unexpected opportunities for necessary cooperation across borders. Economic success can be seen only in the long term.

[WIRTSCHAFTSWOCHE] Then you must also finance for the long term. Where will the money come from?

[Schrempp] All told the aeronautical division of DASA is earning money and space operations are also in the black. Defense technology and engines are only marginally profitable at this time.

[WIRTSCHAFTSWOCHE] So DASA is in the black this year primarily because of Airbus?

[Schrempp] It was not always so but is true today. Without Airbus the aeronautical area would be in the red because of the substantial advance work for the Dornier 328. Altogether we will be in the black in our operations. We do not yet know what the net results will be, for the reserves for the planned personnel cuts will have an effect on that.

[WIRTSCHAFTSWOCHE] Under the agreement with the Dutch government, you are supposed to pay 37 Dutch guilders for each share of Fokker. The books are now being examined. What happens if weaknesses come to light in the investigation of the company?

[Schrempp] In the contract, there is an addendum to the price: "Provided that this will be supported by the findings of due diligence." So if we were to find something that makes this sum appear unjustified, then this price cannot apply. We must make sure that we can live with this deal. But I do not see any problems at this time. The final contract is to be signed soon.

[WIRTSCHAFTSWOCHE] DASA, together with Fokker, will be the largest European aeronautical and space group. Will the new strength help you in further negotiations on cooperation?

[Schrempp] Certainly size is no goal in itself. Of course DASA will benefit by joining the "major league" of the aircraft manufacturers. This will also improve our possibilities for cooperation. Besides, we already intended to participate in the market for 80- to 130-seat regional jets with our Regioliner project. The solution with Fokker is clearly better, for it saves us a lot of money that we would have had to spend on the development of the Regioliner. Remember that Fokker has an outstanding infrastructure worldwide and hence access to the market. The Dutch state will continue to share proportionately in future development costs—for the Fokker 70, for example. In addition, our aircraft plants also profit from new Fokker programs—we already have a 28-percent participation in the Fokker 100. So we are creating jobs for ourselves as well. If we can now also involve Aerospatiale and Alenia in cooperation for regional aircraft, then we will have done a great thing for Europe.

[WIRTSCHAFTSWOCHE] Are you still certain that the Italians and the French want to participate?

[Schrempp] It was with their consent that we began the talks with Fokker and we have kept them informed of the progress. We have already begun negotiations on a 25-percent participation of each of them in our holding company, which holds 51 percent of Fokker. For the industrial concept, we will now take a look at the in part overlapping aircraft programs and above all at the lifetimes of all models from Dornier and the ATR [Regional transport Aircraft] consortium of Aerospatiale and Alenia and of the Fokker 50 and Fokker 100. In the medium term, we must decide on a general program for turboprops with between 20 and 70 seats and jets with 70 to 130 seats.

[WIRTSCHAFTSWOCHE] Will there not be difficulties if one of the partners has to give up a model on account of the overlapping?

[Schrempp] First of all, we have the possibility of terminating the program for the Fokker 50 for strategic reasons, that is, to facilitate other reasonable cooperation. That was one of the reasons why the talks with the Dutch government were so difficult toward the end.

Thanks to Fokker with its extensive marketing network, we are now in a very good starting position for the coming talks as well.

[WIRTSCHAFTSWOCHE] Does that mean that if necessary you can do without the ATR group and then sell your Dornier aircraft through the Fokker network?

[Schrempp] I do not want to go that far. Our first priority is the large European regional aircraft group with ATR. In this way, we will be in the best position to counter the future competitors from Southeast Asia. But there are also others interested in a partnership with Fokker.

[WIRTSCHAFTSWOCHE] Who?

[Schrempp] One in Europe and one outside of Europe.

Fokker Acquisition Seen Risky for DASA

93GE0100X Duesseldorf WIRTSCHAFTSWOCHE in German 27 Nov 92 pp 194-195, 198

[Report by Wieland Schmitz: "Filling the Gap: DASA CEO Schrempp Strengthening Position Within Daimler Conglomerate, but Participation in Fokker Poses Considerable Risks"]

[Text] Juergen Schrempp's chances of succeeding Edzard Reuter as head of Daimler Benz are increasing. The powerful chairman defends Deutsche Aerospace AG (DASA) and its chief staunchly: Investments in aerospace are to be seen in the long term and would not yield a profit until later. That has cost billions so far, but Schrempp is being allowed to spend more than 800 million German marks [DM] for the takeover (51 percent) of the Dutch aircraft company, Fokker.

Thus, after Dornier and MBB, DASA now has another financially weak concern around its neck. With Fokker, DASA moves to first place among the European aerospace concerns—ahead of the French Aerospatiale (Sales: DM14 billion. Employees: 25,900) and British Aerospace (Sales: DM11 billion. Employees: 115,000). Worldwide the grouping made up of Dornier, Messerschmidt-Boelkow-Blohm (MBB), Motoren- und Turbinen-Union GmbH (MTU), Telefunken-Systemtechnik, and Fokker, with sales of more than DM21 billion, is in fourth place behind Boeing, McDonnell Douglas, and General Electric.

The new large firm is only one side of the coin, however. Schrempp is expanding in a period of acute market weakness whose end is not in sight. Short-time work and personnel cuts characterize the aerospace and arms industry worldwide. The European consortium, Airbus Industry, is certainly profiting from an enormous backlog of orders, but with about 100 aircraft in 1991 it booked only one-fourth of the orders of the previous year. They will be even fewer in 1992. And then come cancelations of orders and postponements of delivery dates. The production plans are constantly being reduced. The business with military technology and aircraft, which accounted for a good third of the DASA/Airbus sales of just under DM18 billion just last year and which yielded good profits, is declining continually. The "soft landing" that Schrempp and Reuter are hoping for is in danger.

DASA, most recently employing 70,000 including the large aircraft builders of Deutsche Airbus, must lay off 7,500 workers and is working short time in several plants. Fokker announced short-time work for 5,000 of its 12,000 employees because of a lack of demand for its 50 and 100-seat regional aircraft. The work force is now to be "permanently reduced" through early retirement. Only the Fighter 90, which is now supposed to go into series production in a reduced number and a slimmed-down version at a unit cost of DM90 million, will slow the downturn for DASA somewhat. It may even mean the last chance of salvation for the MBB sites of Ottobrunn, Augsburg, and Manching as well as for the engine builders at MTU in Munich.

The continual cuts in the state space budget are also hitting Werner Heinzmann, Dornier chief and at the same time coordinator for the space activities of MBB, Dornier, and Erno, hard. Just a few days ago, the manned space programs for which DASA had prepared itself fully were further cut by the conference of ministers of the European Space Agency (ESA) in Granada.

The dependence upon state arms and space orders, which account for almost 40 percent of DASA/Airbus sales, is proving to be fateful. Only tediously and painstakingly is Schrempp able to replace fractions of the lost military sales through marketable civilian products. At the same time, the market for commercial satellites and delivery systems is already suffering from overcapacity.

But the worse the environment, the more optimistic the DASA-chief is. After the move from the elegant Leopoldstrasse in Munich to the austere buildings of MBB in Ottobrunn, he has set up a luxurious office for himself. For, "in the long term," he sees a brilliant future for DASA—"the pearl" of the Daimler concern.

To be sure, Schrempp has restructured the most important firms of the German aerospace industry. The result, however, is far from what he planned three years ago: integration into a concern with unified management in which the traditional enterprise limits fall away and a "new mutually motivating DASA-consciousness" arises. Its implementation is failing in part because of "chaotic conditions and substantial frictional losses." Some members of the works committee go on to say: The reality is largely "unnerving."

Schrempp still faces the biggest problem, however. Certainly the participation in Fokker is more favorable than the complete development of a new regional jet program (Regioliner) for DM2.5 billion. But this does not solve the problem of Dornier's unprofitable regional aircraft program for Schrempp. He must first interest his colleagues at the French Aerospatiale and the Italian Alenia companies in participating in the risks of Fokker and

then in a cooperation with Dornier. For the costly aircraft construction at Dornier (18- and 30-seat turboprops) is viable only in a large marketing alliance.

The gap between Dornier's small regional aircraft and the large one of Fokker can be bridged only by the French-Italian joint series ATR [Regional Transport Aircraft]. But Aerospatiale and Alenia find themselves in a marketing crisis. They could lose interest in a costly Fokker participation under German leadership. If Schrempp is able to put together a large European regional aircraft group with a comprehensive product program, his path to the top in Stuttgart will be clear.

Success on Schrempp's part would also benefit his finance chief Manfred Bischoff. He is supposed to succeed finance chief Gerhard Liener in the concern. The new chief of DASA will then be Deutsche Airbus Chairman Hartmut Mehdorn, whose finance office is to be occupied by Wolfgang Piller, formerly office chief for Franz-Josef Strauss, finance chief of MBB, and enterprise strategist for DASA.

The New DASA [Deutsche Aerospace]

	Sales (billions of DM)	Employees	Fields
Daimler-Benz Luft- und Raumfahrt Holding AG (DALURA)			
DASA	11.5	51,500	Civilian and military aeronautics, space operations, military technology, diversification, integrated: Deutsche Airbus GmbH
Fokker-Holding			
Fokker	3.5	12,600	Civilian (regional aircraft) and military aeronautics, space operations, military technology, diversification
Dornier GmbH	2.4	9,500	Civilian (regional aircraft) and military aeronautics, space operations, military technology, medical technology (with MBB medical technology)
MTU	3.5	17,000	Aircraft engines, diesel engines
Erno	.701	1.420	Space operations

Company Held	Percent Held by Fokker Holding	Percent Held by DASA
Fokker Holding	—	78
Fokker	51	—
Dornier GmbH	—	57.55
MTU	—	100
Erno	—	100

French-Italian Accord To Recapitalize SGS-Thomson

93WS0105A Paris LE MONDE in French 12 Nov 92 p 14

[Article signed C.M.: "The French and the Italians Have Signed an Agreement on SGS-Thomson Recapitalization; 5-Billion Franc [Fr] Equity Contribution"]

[Text] Fresh money, new investors: SGS-Thomson, the semiconductor manufacturer ranking 13th worldwide and second in Europe, now knows the terms and conditions of its financing for the next five years. In fact, on Tuesday, 10 November, at the French-Italian summit organized in the French capital (see page 5), Paris and Rome reached an agreement on the recapitalization of the chip manufacturer which, until now, was controlled jointly by Thomson-CSF, a subsidiary of the state-owned Thomson group, and Finmeccanica, one of the many companies belonging to the Italian state's holding IRI [Industrial Reconstruction Institute].

It was not a simple matter. One year ago, SGS-Thomson submitted to its shareholders a development plan requiring a $1-billion contribution (about 5 billion francs [Fr]) over five years. A political choice, the decision to recapitalize SGS-Thomson was quickly made on the French side.

It seems that it was not as firmly made on the Italian side, which eventually allowed itself to be persuaded by the French activism. Support for the European electronic industry and components was viewed as a top priority by Mrs. Edith Cresson's staff when she was prime minister. Her conviction was shared by Mr. Dominique Strauss-Kahn, who remained minister of industry and eventually brought the matter to an end.

The French and the Italians will each contribute one-half of the funds. In addition, $500 million of the $1 billion mobilized will be paid in by the end of the year.

For the French party, the required effort was divided among Thomson-CSF, CEA-Industrie [Atomic Energy Commission-Industry], and France Telecom. As for the Italian side, it will find resources not at the IRI, which is currently being restructured and sorely lacks funds, but at the ENEA [National Committee for the R&D of Nuclear and Alternative Energies], a nuclear kitty similar to CEA-Industrie.

New Deal

As Thomson-CSF has no great wish to take on, for the French, full industrial and financial responsibility for the components pole, a redistribution of the capital proved necessary. Finalized in September, the main lines of this new deal were just published.

Thomson-CSF, which will play a decreasing part in SGS-Thomson (France Telecom and CEA-Industry together will own most of the French participation), will be the main funds provider for the time being. Of the $250 million to be supplied by the French side before the end of 1992, a little under $125 million will be contributed by Thomson-CSF; France Telecom and CEA-Industry will provide the rest. The appointment of CEA-Industry as industrial operator for SGS-Thomson was confirmed.

The French and Italian governments also agreed to provide an additional $1 billion in the form of research and development subsidies for new components generations.

French Software Firms Face Increasing Competition

93WS0117C Paris L'USINE NOUVELLE in French 5 Nov 92 pp 20, 21

[Article by Dominique Commiot: "Software Firms Handicapped by Market Trends"; first paragraph is L'USINE NOUVELLE introduction]

[Text] Gone are the good old days of specific application programs for users. It is the publishers of software packages who are reaping the benefits of the industry's growth. Buying a product that is ready to use off the shelf is cheaper.

The warning bells are sounding for French computer service companies. The top one, Cap Gemini, is going to slash 10 percent of its staff, or 600 people, in France. Its turnover is stagnant when calculated for a constant sales territory. And although it managed to limit the drop in its profits to 20 percent, it did so only through a real-estate transaction that earned it capital gains of 380 million French francs [Fr] before taxes.

Cap Gemini's difficulties are shared by many other software houses (service and computer engineering companies) and reveal a structural fragility that cannot be explained wholly by the economic slump. With a few rare exceptions, our champions are not much in evidence in the booming niche of standard programs, that is, software packages.

On the whole, the computer services market is still posting an enviable, if slower, rate of growth.

In France, growth will still reach 7 to 8 percent this year. But the favored niche of French companies—the development of applications tailored to specific users—is no longer bringing them in the door.

Manufacturers—the makers and editors of software products—are profiting from the industry's growth much more than the craftsmen who offer intellectual services. Microsoft, the world's leader in software packages for desktop computers, grew 40 percent in France last year. Oracle, which specializes in management systems for relational databases, employs 500 in our country and is creating 100 more jobs. And the German firm SAP, a specialist in bundled applications for big systems, is making spectacular strides in penetrating the market.

The trend is accelerating in France where, until now, and more than anywhere else, companies favored specific applications. The demand for such programs is down sharply. "French users are shifting sharply toward purchasing big application packages," confirms Frederic-Georges Roux, the assistant general director of EDS-GFI, the French subsidiary of the world's top software house. This change is seriously eating into the profitibility of specialists in custom-made products like Cap Sogeti. In between two contracts for a given customer, the firm must continue to pay engineers' salaries, which nibble away at its gross margins. It is a dominant trend, which is linked to the priority users assign to squeezing costs and spurred by technological change.

Buying a ready-to-use product costs signficantly less than developing a specific program, provided that the inevitable tailoring is not too extensive. Maintenance costs also drop. And software packages allow companies to organize their data-processing more flexibly. "When the boundaries of a company change, after a merger or acquisition, it is much simpler to bring the [different] information systems closer in line," explains Serge Seletzky, data-processing director of the Elf group.

Since development costs are sharply reduced, flexibility also increases. "We are looking for disposable applications, for we want to be able to change a system three years after installing it," says Gerard Leger, head of computing at LVMH. Anything that makes a company more autonomous in relation to its inhouse computing is highly sought after. Software packages do away with the sometimes nightmarish experience of maintaining a big application after the project head that developed it inhouse has decamped.

Technology is moving in the same direction. The introduction of highly powerful desktop computers and work stations, the reduction in size of central computers, and greater use of decentralized data-processing are matched by a standardization of software programs. The trend is shown by the surge in demand for the UNIX operating system, which is available on all kinds of different hardware, and for relational database management systems, which are critical for operating decentralized data-processing systems. Four firms, all of them American, dominate the world market for these products. French software houses are virtually absent, as they are in bundled PC software, another preserve of the Americans.

Application software is becoming standardized. And personnel-payment or accounting programs are no longer the only ones affected. Users are turning to very large products, which are purchased like turnkey operations and which can take over the management of the entire company. The German company SAP, founded in 1972 by four IBM engineers, is exploding in this market. SAP's sales (Fr2.4 billion) grew 41 percent in 1991, and generated net profits of 17 percent. The firm maintains that four out of five central computers in Germany run at least one of its software packages. And it makes 45 percent of its sales abroad.

German Competition

SAP's presence in France, where it created a subsidiary in 1987, is still modest. The company posted sales of Fr80 million in 1991, but is expected to grow nearly 30 percent this year. And its portfolio of clients already includes Elf, Renault, Total, Pasteur-Merieux, Sextant Avionique, and even France Telecom. Most big companies display a marked interest in integrated software packages. According to a survey by 01 REFERENCES, 34 percent of French firms plan to step up their purchases of application packages in 1993, even though their data-processing budgets will not increase overall.

There are few French software houses that can rival SAP on its turf, because none of them have industrialized their activities to the same degree. SAP is first and foremost a software factory. The company opened a new development center this year. Its huge production shop will be able to house 1,800 developers. What is more, SAP has just concluded a big technology agreement with the German leader in the field, Software AG, whose sales barely outstrip SAP's. The two firms are established in niches that are highly complementary, and had been studying a merger or mutual holdings for three years. They have decided to retain their independence, while sharing the enormous research and development costs required in their field. Indeed, SAP's research and development costs eat up 24 percent of its sales.

On that scale, no French software house compares. Yet Sema Group acquired the same industrial culture in Germany. In December 1990 the firm run by Pierre Bonelli took over the German company ADV/Orga, which had a turnover of Fr200 million. Like SAP or Software AG, the firm offers a product line of integrated software packages under the name I-Linie. Burdened by research and development costs that equal nearly 50 percent of its sales, the company, now Sema Group Systems, is losing money. But Sema has just signed a strategic agreement with IBM to bring I-Linie packages closer to Big Blue's complementary products for computer-assisted production management and logistics.

The complementary software packages of the two companies will henceforth be developed jointly, and each partner will market a unified group of products. With the backing of the world's top computer company, Sema may become a player to be reckoned with in the bundled software market. Only two others in the top 10 list of French software houses earn a significant share of their revenue from software packages: CGI and GSA.

Public Orders Fall

France's weakness in bundled software is all the more worrisome as our software houses are also suffering from the drop in public orders. Many of them thrived under the wing of big programs in the nuclear, weapons, telecommunications, and space industries. A notable example is Cap Gemini Sogeti, which still writes Fr1 billion a year worth of public orders, 600 million with France Telecom. That amounts to 10 percent of its sales.

The squeeze in public spending is now making itself felt, particularly in defense. In the 1991 budget of the General Weapons Delegation, the only programs "involving a substantial amount of software" shrank 4 percent to Fr4.7 billion. In 1990 they grew 27 percent. This loss of resources, like the rise of software packages, is depressing the profitability of French firms. True, the latter are hanging on to their top position in Europe. But the economic slump has shown how fragile they are, a condition that was masked until now by the extremely strong expansion of the computer services market. Even Cap Gemini, though the only one that is international in size, is feeling the blow. To compete with the multinational firms that are invading the industry, Serge Kampf's group has already solicited the backing of Daimler Benz, which holds 39 percent of its capital. And it is negotiating a seat at its table for France Telecom. The surge in software packages has made the fact obvious: Computer services are becoming an industry like any other, dominated by a small number of world giants.

Chart Information: A Meager Portion

Listed below is the share of business done by the top ten French software houses in software packages. Sales are given in billions of French francs for 1991, followed by the percentage of each firm's sales that were generated by bundled software.

1. Cap Gemini Sogeti: 10; N/A 2. Sema Group: 4.1; 9 3. Sligos: 3.2; 5 4. GSI: 2.4; 23 5. Axime: 2.2; 4 6. CGI*: 2; 40 7. Telesystemes: 1.7; 8 8. CISI: 1.5; 6 9. Concept: 1.5; 44 10. Syseca: 1.3; 10

*Fiscal year ending August, 1992. Source: L'USINE NOUVELLE/INPUT

EUROPE-ASIA RELATIONS

Volkswagen Plans to Expand Production in China

93WS0012A Duesseldorf HANDELSBLATT in German 28 Sep 92 p 27

[Article by Peter Seidlitz: "Volkswagen AG Will Accept the Japanese Challenge in East Asia"]

[Text]

The Automobile Industry in China

The annual demand of one million cars originally planned for the turn of the century has been doubled.

Heinz Bauer is the representative of Volkswagen AG for China. His office is on the twenty-second floor of the China World Tower, Beijing's newest office tower at Jianguomenwai Avenue No. 1. From here, Bauer has a bird's eye view of the Chinese world and the automobile market. Traffic is already backing up on the eight-lane parade boulevard in front of his window. And Mao Zedong looks down unperturbed from the Gate of Heavenly Peace onto the throng of Toyotas, Nissans, Audis and Volkswagens on Tiananmen Square. Masses of Red Guards once paid homage to the Chairman in front of this gate.

Beijing has 10 million inhabitants. It is the bicycle capital of the world with over three million people traveling to work every day by bicycle. A flood of automobiles is approaching Beijing, just like other cities in the Middle Kingdom. At this time, only 300,000 new cars are registered every year in the most populated country on earth. One third of these are German cars manufactured in China. Another third are sold by other manufacturers from Japan and France. The rest enter the country as imports. Many of these travel the winding paths of a gray market over which the central government in Beijing has long since lost control.

However, the China National Automobile Industry Corp. (NAIC) recently doubled the annual demand of one million automobiles originally planned for the turn of the century to two million. According to Heinz Bauer, China is now the most important future market for Volkswagen AG, following Europe, but ahead of North and South America, Mexico, South Africa and Nigeria. The company chose to invest in China at the beginning of the 80s in a strategic company decision.

Volkswagen is trying to maintain the largest market share in the Middle Kingdom with three locations in the People's Republic of China and on Taiwan, and a network of 200 suppliers. Besides this, the people from Wolfsburg would also like to sell the automobiles made in China in southeast Asia and South America. Parts made in China would then be delivered to other factories of the company. With the production facilities in China, Volkswagen wants to challenge the Japanese on their own doorstep and to reconquer the market in Asia lost during the 70s. According to Bauer, "We were simply too expensive."

Besides the first Chinese Volkswagen factory in Shanghai (current production: 70,000 Santanas), 100,000 Jetta and Golf Volkswagens are to be built annually in the new Changchun factory in as little as three years. Both factories are designed for a capacity of 300,000 automobiles each. In addition, VW wants to restructure the current licensing agreement to produce the Audi in China into a joint venture. Then, 60,000 Audis (currently: 17,000) would be built in China. VW also wants to build 120,000 van buses (T4) in a factory for both Chinese markets and Asia in Taipei on Taiwan. "Production does not become profitable until we hit 1,000 cars per day," says Bauer. VW is also checking other factory locations in the region, including India.

Besides the Taiwan project, VW is in charge of two of the three planned large automobile factories in China. VW's only competition has come from a Citroen factory. This factory is being built in an extremely unfavorable area, in terms of traffic, in the Chinese industrial region in Wuhan in central China. Citroen will soon be producing 150,000 CXs there. In three smaller projects, Chrysler is building a Jeep in Beijing, Diahatsu is building a Charade model in Tianjin, and Peugeot is building small quantities of the 505 in Guangzhou in southern China. Subaru and Suzuki are in charge of two other very small projects to produce subcompacts. These cars are virtually without competition.

There will soon be a lot of competition for Volkswagen. The coming membership in GATT will force China to eliminate automobile tariffs for imports—up to 200 percent now. VW-China will be able to protect itself for a transitional period. "Then, we will have to be competitive, something that we are not yet," says Heinz Bauer. The widespread opinion that automobiles can be produced cheaply in a low-wage country such as China is false. The portion of wage costs in automobile construction is only 10 percent. Plants and material consume the major portion of investment. At this time, the Santana costs 165,000 yuan in China. This converts to a good 47,000 Deutsche marks [DM]. A comparable Santana in Germany would cost about DM30,000.

The Santana built in China—70 percent of its parts come from China—has not been very popular in the management ranks of Chinese companies or with the authorities who purchase most cars. For the cadre who all have chauffeurs, the back seats in Volkswagens are considered too uncomfortable. For this reason, a new model developed with VW-Brazil and having an extended chassis will appear on the Chinese market, probably in 1994. The new Chinese VW is to provide more space for the party bosses, thereby giving them more prestige and "face."

The Japanese, in a strategic decision considered wrong by VW, long considered China to be only a supplier market. They are now also pressuring China into projects in secret negotiations. Nissan wants to push into the luxury market (dominated previously by Audi and Mercedes) with the Cedric model. Toyota is planning a utility vehicle and engine factory in Shenyang. Mazda has completed plans for an automobile factory on the island of Hainan between Hong Kong and Vietnam. Hainan is the only tax-privileged special economy province of China. Other Japanese companies, led by Kumagai Gumi (Hong Kong), have secured for themselves here generous land concessions to construct a "new

Hong Kong." The Chinese have not had only good experiences with the Japanese. Nippon's industry, for example, supplied only obsolete equipment to China for a clutch-lining factory.

The expansion of VW in China was only accompanied with hesitation by German banks. The introduction of a new model, always involving enormous costs, will be financed by VW in 1993 with its own funds from the Shanghai factory. For the second VW factory—an integration of the two independent joint ventures desired by VW did not materialize—the Bank of China (BOC) helped with foreign-currency credits partially booked via Hong Kong. These credits were cheaper than those of German banks, determined VW to its surprise.

With marketing, until now, VW was more thrifty and reserved than the Japanese. They drove home their brand names to the Chinese using saturation advertising. Recently, the VW-Audi logo can be found on large billboards, even in Tibet. To emphasize the "peoples' character" of the automobile, Volkswagen is sponsoring the Chinese employment of the popular soccer coach Schlappner (formerly of SV Waldhof Mannheim and Jena). He is to bring the Chinese national team up to speed. In October, VW-Audi will sponsor the Oktoberfest in Beijing.

Belgium: Alcatel Bell To Triple Production in PRC

93BR0052 Paris ELECTRONIQUE INTERNATIONAL HEBDO in French 1 Oct 92 p 4

[Text] Shanghai Bell—the joint venture founded in 1983 by Belgian Alcatel subsidiary Alcatel Bell and by the Chinese Ministry of Communications, which has a 60-percent stake—is planning to increase its annual production capacity to 4 million telephone lines in 1998. In line with this objective, the company is planning to build a second plant which will employ over 2,700 workers. It now employs 1,650 people and manufactures the Alcatel 1000-S12 digital switching system, transmission equipment, and private telephone exchanges. The company's investments will thus climb from ECU60 million in December 1991 to ECU245 million in December 1997.

In addition, the Ministry and Alcatel also signed licensing and cooperation agreements mainly for the GSM [Special Mobile Group] mobile telephone system. These agreements should allow Shanghai Bell to achieve a turnover of ECU7 billion in the Chinese market over 20 years. Shanghai Bell also has a 40-percent stake in Shanghai Belling, which supplies integrated circuits for the local manufacture of the 1000-S12 system. Shanghai Belling will also increase its annual production capacity to achieve an output of 3.8 million chips by 1998. Alcatel estimates that they have already taken 50 percent of the Chinese orders for digital lines.

Toshiba Opens ASIC Plant in Braunschweig

93WS0083D Duesseldorf HANDELSBLATT in German 27 Oct 92 p 18

[Article by VST: "Semiconductor Industry: Market Is Gradually Recovering; Toshiba Plant in Braunschweig With Customer-Specific Chips"]

[Text] Braunschweig, HANDELSBLATT, Monday, 26 Oct—The past two years were hard ones for the semiconductor industry, Tsuyoshi Kawanishi, a senior executive vice president of the Toshiba Corp., Tokyo, said on the occasion of the 10th anniversary of its subsidiary, Toshiba Semiconductor, Ltd., in Braunschweig.

Kawanishi said that the first sign of recovery can now be seen. Of the regional markets, Japan is hardest hit by the recession, while the remaining Asian market shows the highest growth rate. The U.S. market appears to be recovering, especially computers and peripherals. Europe is moving toward recovery.

With regard to the establishment of silicon wafer production through Toshiba in Europe, Kawanishi said that such production would be from 15 to 20 percent more expensive than in Japan. However, the final decision has not yet been made.

Managing director A. Onoyama said that Toshibs Semiconductor, Ltd., has up to now invested over DM100 million in the Braunschweig plant, which at present employs over 200 workers. It was the first company in Europe to begin production of 1-megabit-DRAM [dynamic random access memory] chips in February 1987.

In 1991 they began to produce 4-megabit chips and, since May 1992, they have been supplying customer-specific chips (ASICs [application-specific integrated circuit]). The Braunschweig company, which showed a small annual loss of DM99,300 in fiscal year 1990-1991 (31 March) due to the drop in prices, has realized a profit of DM1.4 million in 1991-1992 and fundamentally operates on a profitable basis. All told, the firm, which owns a videorecorder plant in Moenchengladbach and a plant for laptops (portable computers) and printed circuits in Regensburg, employs 1,490 people in Germany and a total of 5,300 in Europe.

Japanese Research Penetration in EC Discussed

93BR0185 Rijswijk POLYTECHNISCH WEEKBLAD in Dutch 12 Nov 92 p 7

[Article by Joop Wenstedt: "Japan Stalks Western Research"]

[Text] Buy your way into a university, and you have creative developers at your disposal. In recent years, Japanese companies have been entering into lucrative contracts with, above all, British universities. In a short time the Oriental enterprises will be in a position to produce innovative products.

For many years the Japanese have been trying to tempt American and European researchers and developers to come to Japan. The Japanese culture has rendered these attempts unsuccessful.

Japanese companies have now found another source for their knowledge. Jean-Pierre Lehman, professor and director of the European Institute of Japanese Studies in Stockholm, says about the insidious innovation strategy of Japanese companies: "Japanese companies have opened no less than 50 research centers in Europe over the last five years. No real innovative activities have yet been carried out in these think tanks. In a few years, however, that will start to happen, particularly if they employ the right people."

They are also entering into attractive research contracts with universities, often for long periods and for many millions of guilders, according to Lehman. Contracting out for research is, says Lehman, evidence that Japan is still unable to master sufficient technical creativity. "Japan is and remains a nation that is good at copying and improving. They have managed to reach such a high level that the rest of the world does not notice that they are merely adding improvements. For real creativity, they need the 'old world'." Japanese universities are not able to undertake innovative research, as a result of the traditional attitudes within these institutions. The Japanese would rather play it safe by introducing a small improvement, than by taking a leap into the dark. The only Japanese ever to receive an award for scientific research was working in a laboratory in the United States of America.

Offer

By finding their way into western universities, Japanese companies have also been able to get hold of talented students and researchers. They observe who comes forward with good ideas and after a short while they will make an interesting offer. The graduate or more experienced researcher does not need to go to Japan. He or she can stay in his or her own country, but will benefit from a good Japanese salary.

Mitsubishi Enters EC Nuclear Market via Belgian Contract

93BR0190 Zellik BELGIAN BUSINESS & INDUSTRIE in French Oct 92 pp 95, 97

[Article by Marc Magain: "Tora, Tora Over Tihange!"]

[Text] The Japanese nuclear industry lands in Europe, more particularly at Tihange. EDF [French Electricity Company] and Electrabel award 1.2-billion-Belgian-franc [BFr] contract to Mitsubishi.

In the field of nuclear energy, collaboration between Belgian and French electricians is nothing new. Thus, after Chooz A, in the early seventies, they put together the Tihange 1 project. The 870-megawatt unit came on stream in 1975. The operator of this first nuclear plant on Belgian soil is SEMO (Belgian-French Meuse Region Nuclear Energy Company), a 50-50 Belgian-French joint venture.

100 Billion

Soon joined at the same site by two other wholly Belgian reactors with the same power (in 1982 and 1985), Tihange 1 has just passed 100 billion kWh mark in power generated. This puts the unit in third place among the world's top contenders—just after Germany's Biblis 1 and Unterweser. With 125,000 hours of operation, this pressurized water reactor (PWR) achieves the highly enviable coefficient of 79 percent utilization (94 percent excluding shutdowns for reloading!). This record is to be fittingly celebrated early in March when the plant will fete the milestone.

Under a big-top erected for the occasion, the staff, local authorities, political authorities, suppliers, and the press have been invited to a gala feast. On the fringes of the festivities, however, behind their smiles SEMO managers will have difficulty hiding their concern. For good reason—they are aware of the first serious inroads by the Japanese nuclear industry into the European market. Mitsubishi, Westinghouse's Japanese licensee, submitted the lowest bid to replace the three Tihange-1 steam generators (see box). A real karate blow—Mitsubishi's offer of BFr1.2 billion was, according to our information, 30 percent lower than the only rival bid, submitted by the French firm Framatome, in association with the German firm KWU-Siemens. On the Belgian side, hardly any hesitation! Electrabel, a private company, plans to follow free market laws and award the contract to the lowest bidder. The firm washes its hands of the problem, declaring: "We are in agreement on the desirability of selecting a European firm, but who will pay the difference?"

Implication: "Not us!" EDF retreated in embarrassment. How to refuse a contract like this to Framatome-Siemens and to award it to those...Japanese ants?

Japanese OK

EDF, therefore, postponed the decision. Three weeks later it appeared in the form of a laconic announcement by Electrabel: "SEMO had initiated a call for bids for the supply of equipment. The contract has been awarded to Mitsubishi, whose bid proved both technically and commercially valid, while offering a substantial advantage from the standpoint of price." In short, SEMO is procuring Japanese equipment. The sons of the Rising Sun are thus making a notable entry into the European nuclear market. EDF did try to ease the prices of the European duo Framatome-Siemens—to no avail. EDF, a French state-run company, is thus awarding a contract to a Japanese firm, and is doing so right under the nose of a French bidder.

Stupefying? Not really! According to the Belgian partners—who broach the matter in hushed tones—the adventure, as politically embarrassing as it was for their

French counterparts, serves the interests of EDF. In the case of the Tihange-1 contract, among the bidders were European suppliers, who sought to take advantage of their privileged position (their bid being the only valid one), and the Japanese winners, who reigned in prices to break into Europe. There are no more than 10 or so potential steam generator suppliers throughout the world: Westinghouse, Framatome, KWU-Siemens (these last two being associated), Mitsubishi, Babcock, and some others. For an idea of the potential market: the Americans tendered bids for more than 100 steam generators. This explains why Westinghouse did not submit a valid offer for Tihange 1, as involved as the U.S. firm is with its own market.

Backwash

For EDF, which in the coming years will have to change many steam generators in its 50 or so nuclear units, the message for European industry is clear: "Gentlemen, do not take unfair advantage! You are not the only potential suppliers." In Belgium, too, the decision has produced some backwash.

Cockerill Mechanical Industries [CMI] is a potential subcontractor for the manufacture of steam generators. The Cockerill subsidiary has in fact been awarded a substantial contract with KWU-Siemens for the same operation at Doel. The Japanese did thoroughly sound out CMI, but appear to have given up: Their bid to Electrabel and EDF is so close that they prefer to have all the work done in Japan.

As Electrabel demanded no benefits for Belgian industry from Mitsubishi, the sons of the Rising Sun have taken pains to guard against such initiative!